Use cases for augmented, virtual and mixed reality in the manufacturing industry

29 June 2017 | **Augmented & Virtual Reality** | **Lea Allemann**, **Michael Sattler**
Reading time: 4 minutes

We have all heard and read that augmented (AR) and virtual (VR), and lately mixed reality (MR), will have major impacts on companies and change the way we work. Many tech authors and researchers say that companies in the manufacturing industry will be amongst the first to adopt those technologies to revolutionize their way of working. Several leaders, who seem to be far ahead of the competition, say that they are already working with the technologies. Yet, what is with all the others, the "normal" companies? Has someone ever talked to them? Are they even willing to adopt these technologies? And if so, in which use cases, why and when?

I interviewed several representatives of different companies in the Swiss manufacturing industry. I wanted to find out in which use cases they see value for their companies, what benefits they perceive and which obstacles they are facing. The first post of this three-part blog series focuses on the use cases. The second one will highlight the business value and improvements those companies hope for. The third one will examine the obstacles and challenges they see.

Possible use cases. (Zuehlke)

Company representatives included CEOs, CTOs, site directors yet also product or project managers. In order gain a broad view on the topic, I purposefully chose a variety of different

firms of various sizes and from different sub-branches. Generally, the companies see valuable use cases in most processes along Porter's Value Chain. Namely in Human Resources Management, Technology Development, Logistics, Operations, Marketing & Sales and Service.

Looking at the processes in **Human Resource Management**, the company representatives think that VR offers an ideal possibility to train all kinds of workflows including dangerous scenarios. As an example, the handling of machines or evacuation from a production site might be suitable scenarios. In addition, AR and VR can also support the acquisition of talents by providing a modern work environment.

In **Technology Development** processes, my interview partners see the most benefits in the virtual or augmented planning of factories or production lines. Several perceive great value in placing digital copies of new machines virtually in the real factory environment. They hope that this would facilitate the planning and help to avoid mistakes. As an example, they would be able to detect the collision of the new machine with a pipe on the ceiling before making the expensive purchase. Yet the technologies are not only useful for factory planners but also for product designers and engineers. VR allows "stepping into" full-scale models for inspection or communication. Additionally, AR as well as VR can facilitate the communication between disciplines but also between two sites by simply sharing the same view.

> "It would be fantastic if one could improve the CAD-drawings to an extent where we could step into them via the glasses." (Site Director)

When we look at **Operations**, the top use case for my interview partners is not surprisingly the augmented work instructions. Overlaying work instructions or critical hints directly to the workstations seems intriguing and are an often-discussed application for augmented reality. Other additional information that they would like to overlay to the real world are inventory data, explosion drawings, lead times, and so on. It would also be possible to investigate workflows or accidents thanks to the cameras that are part of the AR glasses. Or workers can document their progress in real-time without the need for their hands as most AR glasses can be controlled by voice.

When it comes to **Logistics**, all company representatives agree on two use cases. They think that there is potential to use AR/VR for navigating through the warehouse or to display what is inside a parcel for example. Furthermore, my interview partners see large potential for both AR and VR in **Marketing and Sales**. They appreciate these use cases because they are comparably simple to implement and thus a good starting point for using the new technologies. For many it would be beneficial to display genuine models of their products

directly in the environment of the customer. Furthermore, delicate products or very specific variations of products could be shown at exhibitions without the need for huge exhibition space, the fear of destroying something or giving away customer secrets to third parties. Several interviewees came up with the idea to bring their BIM (Building Information Modeling) data to VR to make it more accessible for customers. And finally, they simply understand the use of AR/VR as an opportunity to polish the company's reputation.

"It is a sales tool! […] it would be the WOW-effect. I mean, all our competitors are coming […]. And in the end, it is our [sales representative] who needs to be remembered." (Product Manager Digitalization & Industrie 4.0)

In **Service**, the interviewees perceive a variety of use cases from installation to repair as suitable for AR/VR. It starts from [providing the technician or customer with repairing instruction](#), which are easier to follow. This would also allow for an outsourcing of simple tasks or the installation to the customer. Once the service person is on site, one could provide him or her access to and visualization of equipment information, maintenance histories or superimpose real-time diagnosis data over running machines.

"So for service I am convinced that it [AR/VR] will become an essential tool in a relatively short time period from now. […] And in the end, it will make many things much faster. And we will be more flexible… (Product Manager Digitalization & Industry 4.0)

While bloggers and authors of tech articles often emphasize on very technical use cases in engineering or manufacturing, the company representatives favor comparably simple use cases. I was surprised how much they appreciate Marketing & Sales use cases. At the same time, it was striking that they do not see value in certain use cases, which get high media attention. As for example the optimization of workplace ergonomics by using VR simulation. Is this use case perceived as too expensive, too complicated or are there better solutions available? More to this in my next two blog posts about the business value and also the challenges that company representatives perceive.