

AR and VR suggest a new reality

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Augmented and virtual reality technologies have considerable potential, but more development is needed before they can be used routinely in the field. *Julie Tilson reports*

With passenger traffic and flight volumes on the rise, there is a need for increased efficiency in aviation operations and training. Simulation technology is progressively being employed to achieve this objective. Subsets of the simulation world, like virtual reality (VR) and augmented reality (AR), are finding applications within the air transport industry. Functions as diverse as air traffic control (ATC), ground-handling, and security and disaster planning all stand to benefit from advances in these technologies. In addition, some airports are experimenting with passenger applications that include an element of AR.



AR training app for Virgin Atlantic cabin crew. (SITA)

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VR uses a headset for users to interact in a virtual environment. The real environment is not visible through a VR headset. AR, on the other hand, also uses a headset, but it mixes interactive virtual content with the real environment. Both technologies have the potential to optimise training and other operations in the airport industry. Simulation-based training in general provides the potential for efficient, targeted instruction that can be tailored to student requirements. Furthermore, skills can be practiced repeatedly in a safe environment, without using (and risking) live operational assets such as aircraft. Learning data for individual students can be collected through the training process,

enabling instructors to further customise the training plan. Simulation, along with AR/VR, is also a fitting method of training for the younger generation who have grown up in a digital world.

Although AR/VR technologies are promising, they are not universally applicable. In addition, there are remaining capability gaps, although the pace of technological advancement continues to be brisk. Other drawbacks still hinder AR/VR from being used to its fullest extent in airport-training applications. Ergonomics is the primary example. Most VR headsets are bulky and cumbersome to wear, and they lock the user in a virtual world that limits interaction with the actual environment, which is often necessary for training. AR solutions are developing rapidly, but current products are still heavy and bulky and not practical to be worn for long periods of time. In addition, some applications require the headsets to be calibrated to the specific user, which then requires extra time for setting up the headset in between users.

AR/VR technologies are already being employed in the air transport industry, although users and developers are aware of their advantages and disadvantages. On the other hand, some airport operations use simulation but have not taken the leap further into AR/VR applications.

Simulating the future

Air traffic demand growth creates challenges for the overall airport infrastructure, said Frederic Leger, director of airport, passenger, cargo, and security products at the International Air Transport Association (IATA). “The apron, aircraft operations areas, the baggage area – all these areas require efficiency for the satisfaction of the passengers,” he noted, adding that simulation tools are being used in many areas. A simulation tool developed by IATA – based on industry feedback and expertise – helps to predict future traffic flows at an airport, to provide insight into potential capacity problems.

The IATA tool enables airports to investigate scenarios to determine the best course of action for accommodating future growth. “It is very important to airports for doing master planning,” Leger explained. “This helps with the decision to use and optimise the current infrastructure or to invest in new infrastructure – for example a new runway or terminal, or a new airport.”

Training on the ground

Simulation-based training is not a new concept in the air transport industry. However, some companies find that AR/VR enhancements are not well-suited to their specific simulation applications.

For example, ETC Simulation, based in Orlando, Florida, provides the Advanced Disaster Management Simulator (ADMS), which is used for incident command training for emergency situations in an airport setting. ETC also provides driver simulators for training airport vehicle operators (such as for snow removal or firefighting).

Company president Marco van Wijngaarden said that ETC simulation-based training systems do not include AR/VR technology. “With our type of simulators, we train crews and teams most of the time,” he explained. “This means real people communicating with real people and pointing out certain aspects in the scenario. In this training they have to operate real tools such as radios, phones, vehicle controls, maps, and make notes and plans. Adding VR glasses would obstruct many of the goals we achieve with our team and crew training systems.”

Conversely, the Striker Simulator training system from Oshkosh Airport Products enables users to respond to simulated emergencies in a VR cab environment. The cab features real components from the Striker, and includes a 180° forward view and an overhead video monitor showing the Snozzle high-reach extendable turret in action.

[Continued in full version...]

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