



AUGMENTED AND VIRTUAL REALITY

State of Art

(source: innovation community)



TECHNOLOGY OVERVIEW

Augmented Reality (AR) and Virtual Reality (VR) are technological solutions that allow a more effective contact with real objects (AR) or virtual objects (VR) that simulate real elements/situations. These technologies are used for training and/or support to field activities and are based on the use of viewers or smartglasses.

The first applications in operation, in particular for e-distribution, date back to 2013 (network projection). Augmented reality is attracting considerable interest from other energy companies, as well as manufacturing companies, but Enel retains considerable leadership in this sector due to the numerous experiments and early adoption that give the Group a recognized leadership.

In short, the projects carried out by each Business Line involve the following benefits, mainly related to AR for O&M:

- Improvement of Safety aspects;
- Reduction of working hours for specific O&M activities for a better knowledge of the activity in its distinct phases and related risks;
- Efficiency of system data entry operations, in particular in the installation and asset census phases, through the acquisition of objects and tags with AR;
- Availability of information in a direct and immediate way: recognition of objects, guided actions with icons superimposed on the real elements, which support personnel in the execution of activities;
- Possibility to provide assistance to field technicians in different parts of the world without the need to move, with a consequent reduction of travel costs for expert technicians. Think, for example, of the costs and risks for intercontinental EU-Latam travel;
- Guarantee to keep the standard of on-site interventions high, with the greater and wider availability of the most experienced personnel;
- Transforming the processes of post-sales assistance through the realization of AR-tutorial to support customers in the interaction with complex assets (e.g. vehicle recharging infrastructure) and/or in case of malfunctioning allow the automatic recognition in AR of the problem and send the report to the relevant group.

Moreover, the use of AR to make virtual plant visits allows to reduce the time needed to receive offers from suppliers, with a consequent reduction of time related to purchasing procedures and to reduce travel costs: e.g. 6/10k€/person for a 5-day Italy-Chile trip. As far as VR is concerned, it allows:



- A more effective training of the technicians, with an immersive mode that favors the learning of the activities and the setting, also leveraging the emotionality linked to the realistic reproduction of the work scenario (e.g. working at height);
- Reduction of working hours for specific O&M activities, thanks to a better knowledge of procedures and work and space;
- Improvement of Safety aspects for a better knowledge of the activity, the area in which it is to be carried out and the related risks;
- Simulation of critical and emergency situations for which it is not possible to reproduce the scenario with traditional training (e.g. fire management).
- Better verification of the learning of work procedures;

The strength of training through VR is to be able to train a large workforce more quickly and economically than with conventional training in training centres. A note of attention that today (at least in the majority of cases) VR is an additional tool to traditional training as many courses still need hours of classroom training to issue certificates.

Vice-versa as a tool for updating it can certainly be said already today that it can be adopted optimizing time and costs. In fact, with the same set of VRs it is possible to perform multiple scenarios related to as many different application cases, all this by reducing or eliminating the logistics necessary to bring trainees to the training centres. The system also lends itself perfectly to the measurement of how much the user has absorbed the skills in the particular scenario and, if necessary, it allows to administer the entire operational sequence or parts of it again.

ONGOING PROJECTS

Below is a brief description of the main projects carried out :

Marko - provision of multimedia content through object recognition and overlapping AR. The application allows to recognize previously catalogued network elements and to provide the operator, through a layer of AR, inherent operational and security contents. It can be run on both SmartPhone and SmartGlass. Allows you to enter new items and associate content with them, in a few minutes, by a non-specialist user. All this is then immediately made available to the entire mobile force, which no longer has to resort to assistance calls or browse through extensive documents in search of information.

The project has been in production in e-distribution since 2017. Under study/launch in other countries (Brazil by the end of 2019 in Future Of Energy).



ARNet – Application designed to bring the power grid above the reality around the operator. It can be run on both SmartPhone and SmartGlass. In daily operation it allows to easily identify underground elements such as cables or underground cabins. In disaster conditions (earthquakes, snowfalls, floods) it brings enormous reductions in the time it takes to identify the targets of restoration work when hidden by debris, snow or other.

In production in e-distribution since 2013. Under study/launch in other countries (Brazil by the end of 2019 within the Urban Futurability).