Virtual ICU can save real lives. Hospitals train medical workers in it without risk

Surveys and experience gained in practice have shown that teaching in virtual reality is very effective. The České Budějovice-based company Virtual Lab is well aware that almost anything can be taught virtually. In spring 2020, the company’s representatives decided to help in the fight against the coronavirus and entered the Hack the Crisis competition organised by CzechInvest and the Ministry of Industry and Trade. With its virtual intensive care unit, Virtual Lab fought its way to the round of the fifteen best projects. Thanks to the virtual ICU, doctors and nurses will be able to learn to work with very sophisticated instruments without having to be physically present in today’s overburdened medical facilities.

Virtual Lab has already completed the virtual ICU prototype. In the time of the pandemic, the company rapidly responded to the difficult situation faced by many hospitals, which need trained personnel, but whose overburdened ICUs do not have sufficient space for training. Furthermore, strict restrictions on movement also limit suppliers of medical technology, which do not have anywhere to train.

Virtual reality enables doctors and nurses to learn how to attach an instrument and how to connect it to a patient, without the necessity of an actual patient or a real facility. Photo: Virtual Lab
Virtual reality enables doctors and nurses to learn how to attach an instrument and how to connect it to a patient, without the necessity of an actual patient or a real facility. The prototype virtual ICU now exists and it is necessary to obtain feedback from doctors and nurses. “We want them to tell us which situations can be handled in virtual reality and what kind of instruments they need to have there. In spring, we want to present the prototype to twenty hospitals in order to get feedback,” says Kubíček, outlining Virtual Lab’s next steps.

Virtual Lab is in similar talks with instrument suppliers, which are as equally important for it as doctors and nurses. Because of COVID-19 restrictions, it is a problem for them to physically go to hospitals to train personnel. Virtual reality enables them to organise the necessary training.

The human brain learns through repetition and experience. Simply said, when we experience something, we remember it. The interesting thing is that we cannot distinguish between real and virtual situations. If you have ever stood on the ledge of a skyscraper in virtual reality, it is possible you had an intense sensation even though you were standing on solid ground. The virtual experience was so powerful that your body reacted as if you were really standing on the 115th floor. Now imagine the situation in a hospital. An ambulance brings in a patient who needs urgent care in the ICU and, what’s more, this involves a rare diagnosis. For medical workers who have not previously encountered such an intense environment and have not been trained to deal with it, this is definitely not the right time to learn about it. At that moment, it is necessary to summon someone who has the necessary experience. Of course, that increases the medical staff’s workload and, furthermore, does not support the training of those who need it.

We also learn through observation, but actually dealing with such a situation with the whole process of setting up instruments, connecting the patient and then resetting the instruments based on how the patient responds is of course a more powerful learning experience. “Learning in VR saves 30% of time and the ability to recall details is 93% higher than in ordinary training processes,” Kubíček explains. Virtual Lab anticipates that in the future it will be possible for more people to meet and collaborate in the virtual ICU even though they are in different rooms or hospitals.
Czech brains for Czech medical workers and companies

The virtual ICU is equipped with a full range of instruments and devices, and talks with various manufacturers regarding their involvement in the project are currently underway. One of the devices that is already being used on the platform is CoroVent, a unique Czech-made respiratory ventilator that can be rapidly manufactured in large quantities. CoroVent won second place in the Hack the Crisis hackathon organised by CzechInvest and the Ministry of Industry and Trade. And it was that hackathon that brought experts from Virtual Lab together with the creators of CoroVent. “The hackathon brought us a tremendous number of contacts. In addition to that, I have to mention the support that we received from the director of CzechInvest’s South Bohemia office,” say Kubíček, commenting on Virtual Lab’s participation in the hackathon.

Virtual Lab not only found success in Hack the Crisis, but also won second place in the Digital Promotion 4.0 competition, which was organised by CzechInvest in autumn 2020 in cooperation with CzechTrade and the Ministry of Industry and Trade. The purpose of the competition was to map and compare innovative tools in the area of digital presentation that can be used to promote Czech manufacturers and exporters, which lost the possibility to attend expositions and trade fairs due to anti-pandemic measures. Therefore, the state is seeking innovative tools that can help Czech companies. Virtual reality plays an important role in their presentations. “You can invite customers to a virtual venue, you can mingle and talk, and even break your product down into parts. You can simply present it just as you would if you were at the actual exhibition grounds,” says Kubíček, describing Virtual Lab’s solution.

Virtual Lab brings together developers, specialists and enthusiasts in the area of virtual reality with a team of professionals who are able to connect such complicated topics as top medical facilities, for example, with state-of-the-art technologies involving virtual and augmented reality. In addition to being a successful company, Virtual Lab is also a responsible company. Like its parent company, Holistic Management, Virtual Lab provides job opportunities for disabled workers, who can thus engage in meaningful projects that are helping to change the world.

One of the devices that is already being used in the virtual ICU is the Czech-made CoroVent.

Photo: Virtual Lab
About the Hack the Crisis hackathon

Hack the Crisis Czech Republic is a two-month virtual hackathon that was launched in spring 2020 during the first wave of the global coronavirus pandemic. Its purpose was to coordinate the needs of the state with the energy and volunteering found in the IT community and the business environment, thus supporting the implementation of relevant projects that can provide assistance in the crisis situation or mitigate its impacts. The hackathon was organised by CzechInvest and the Ministry of Industry and Trade. A total of 206 projects were entered in the hackathon in the course of its duration. Over fifty partners from the public and private sectors also took part in the event. Free mentoring was provided by more than 130 experts in various fields. More information on the hackathon is available here.

Leoš Kubíček during his presentation at the final of the Hack the Crisis hackathon in June 2020.
Photo: CzechInvest, Dominik Kučera

The virtual ICU is being tested at hospitals in České Budějovice a Jindřichův Hradec.
Photo: Virtual Lab