EU Danube Region Strategy
PA 8 LIGHTHOUSE

DIGITALIZATION, ARTIFICIAL INTELLIGENCE, METAVERSE & VIRTUAL WORLDS

Innovative system of virtual reality and simulated model cases of security character facilitating training and treatment of police officers in risky situations

XR Institute s.r.o., Czech Republic

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Basics

Name: Innovative system of virtual reality and simulated model cases of security character facilitating training and treatment of police officers in risky situations

Country: Czech Republic

Scoring: 46/50

Project Coordinator:

XR Institute s.r.o.

https://www.xr-institute.cz/en/project/project-VRpolice

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Key Project Data:

2023 – 2025

approx. 780.000 €

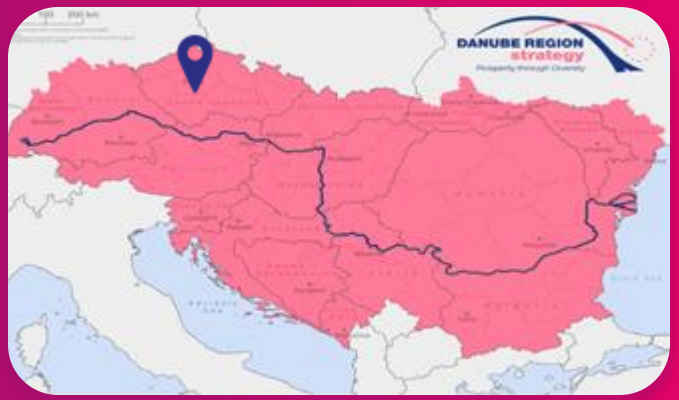
Funded by Operation Program Security – OPSEC by the Ministry of Interior of the Czech Republic

Consortium:

Project partner: Czech Technical University in Prague

Lead partner: XR Institute

Extended Reality Institute



About the project

The project, led by **XR Institute s.r.o**. in partnership with the **Czech Technical University in Prague** develops a **cutting-edge virtual reality (VR) system** in the field of training and reactions in risk situations involving **members of the Police** using virtual reality.

Objective:
Enhancement of the police training and response in high-risk situations.

The system measures and records **physiological reactions**, such as heart rate, of members undergoing training. The software can simulate various scenarios and event variants in line with current developments in the criminal world and the nature of terrorist attacks, as well as the specifics of the locations where interventions take place.

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INNOVATION

The project uses new techniques and technologies, such as hand tracking, voice control and monitoring of the user's stress load in VR.

SUSTAINABILITY

In this case focusing on future-proof sense of sustainability, VR training brings its benefits due to its low cost and simulation of difficult situations compared to training in real conditions.

SCALABILITY

The project creates four scalable applications that can modify the virtual environment, the scope of the scenario or the complexity of the situation.

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Activities

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The project is focused on creating a structured system and is divided in two modules:

1. **Training procedures leading to more efficient service interventions and criminalistic procedures**
2. **Testing the mastery of the correct procedure of behavior in selected security situations**

For this purpose, **4 VR applications** were created, where police officers can train in 4 different scenarios:

1. Crime scene examination of a **murder**
2. Crime scene examination of a **burglary**
3. Active **shooter attack in a hospital**
4. Profiling suspicious persons at the **airport**

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Methodology and Work Packages

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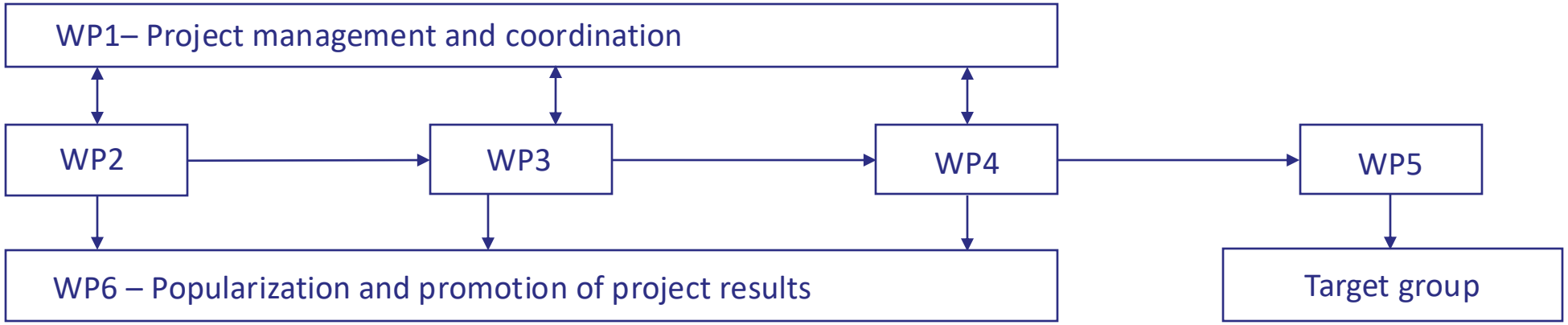
The project used a standard scientific approach and research methods, including six Work Packages:

Analytical part	WP1 – Project management a coordination WP2 – Initial analysis
Development part	WP3 – Development of HW and SW (development of VR applications and sensory software and hardware) WP4 – Documentation (creation of supporting materials)
Testing part	WP5 – Testing and adjustment of outputs WP6 – Popularization a promotion of project results



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Impact

The project has an important impact on their main target group, police officers.

The main benefits of the project is:

- The ability to **train risky situations** in a very **credible and complex environment**
- The simulation of which **in the real world is associated with higher costs** for training preparation
- The **training** itself

Outcome

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The main outputs of the project are the **four high-risk scenarios in the form of VR application** that are completed, tested and optimized until the end of 2025:

- Scene of crime investigation where a **murder** took place
- Scene of crime investigation where a **burglary** took place
- Crisis situation during an active **shooter attack in a hospital**
- Profiling of high-risk individuals suspected of preparing a **terrorist act at an airport**

Several secondary outputs were also achieved as part of the project, which are mainly **publishing and presenting results at conferences.** One of the latest articles was awarded the Best paper award at the Applied Human Factors and Ergonomics conference in Nice, France.

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Review

Barriers

The barriers encountered during the project were mainly technical. The most complex project activity was **connecting the biofeedback sensor to VR applications** and **ensuring adaptation of scenarios based on the user's stress level**.

Tips for future replications

The project outputs are further **scalable and expandable**.
The virtual environment **can be modified into different high-risks scenarios**. As example, the active shooter scenario can also be transferred to a school or public office environment, where such attacks occur relatively often. Furthermore, the scenarios can be modified to **simulate more complex situations**.