Press Release

August 2025

Final Trials of the FLEXI-cross Project Successfully Demonstrated Border Control Innovation Across Europe

The FLEXI-cross project, funded by the European Union, aims to deliver a modular, interoperable, and rapidly deployable toolkit for enhancing border control operations across Europe. By integrating state-of-the-art technologies such as biometric verification, visual analytics, UAV-based surveillance, and intelligent anomaly detection, FLEXI-cross has sought to improve border security while maintaining seamless and pleasant travel experiences. The final validation of the system took place in three distinct Use Cases (UCs), across Romania and Greece, between May 8th and May 15th, 2025, showcasing the effectiveness of the FLEXI-cross solution in real-world scenarios.

UC1: Port-Based Border Control in Galati, Romania

The first Use Case (UC1) trial was held on May 14th, 2025, in Spargatorul Perseus, Dunărea, at the Galati port in Romania. Extensive testing, remote integrations, and scenario rehearsals were conducted for two months leading to the trial by partners ENG, ICCS, EBOS, HOLO, and BEIA. Site surveys took place on April 9–10, 2025, led by ICCS and BEIA, to prepare infrastructure and calibrate UAVs, face verification systems, sensors, and network components.

Objective:

- Perform biometric checks on individuals disembarking from vessels.
- Provide real-time scene monitoring to operators.
- Equip operators with mobile tools for identity verification and risk assessment during disembarkation.

Legacy Systems: None.

Demonstrated Components:

- Acoustic Sensors (BEIA)
- Radiation Sensors (BEIA)
- INUS-UPE platform with tethered UAV (ICCS)

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- FACE-VI mobile app for biometric verification (ICCS)
- ARSA (Augmented Reality Situation Awareness) (HOLO)
- UC1 Control UI (ENG)
- Data Export API & RBAC (ENG)
- Visual Analytics Dashboard (EBOS)
- Web-based FACE-VI UI (ICCS)

All systems were fully integrated and demonstrated in a real environment. A rehearsal was held on May 13, and participants were guided through each scenario using printed booklets and informed consent forms. Attendees included the Project Officer and partners such as ENG, ICCS, BEIA, EBOS, HOLO, WINGS, ATG, GIBP, TCCFR, IGPF, KEMEA, and HPOL.

UC2: Road Border Control at Ormenio BCP, Greece

The second Use Case (UC2) took place on May 8th, 2025, at the Ormenio Border Crossing Point in Evros, Greece. Preceding the trial, WINGS, KEMEA, and EBOS conducted remote integrations and on-site testing. WINGS also led multiple pre-pilot visits to evaluate sensor setups and ensure connectivity.

Objective:

- Detect illegal activities using innovative tech integrated with legacy systems.
- Digitalize and streamline validation processes.
- Enhance traveller and personnel security.
- Validate the mobile citizen app and wi-move backend in real-world conditions.

Legacy Systems:

- Passport Scanner (HPOL)
- SIS2 Database (HPOL)
- UAV (HPOL)
- Scale Sensor (HPOL)

Demonstrated Components:

- Fixed Camera (WINGS)
- OBU with accelerometer, CO_2, temperature, GPS sensors (WINGS)
- License Plate Recognition Camera (WINGS)
- Mobile App for users and border control officers (WINGS)

All integrated components effectively performed detection, risk assessment, and real-time alerts during the live trial. The demonstration was preceded by a rehearsal and introductory presentations. Printed materials supported the live walkthrough of each scenario. Participants included consortium partners and key stakeholders such as FRONTEX, the Greek Army, local HPOL officers, and DG Home's European Policy Officer.

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UC3: Rail Border Control between Romania and Moldova

The third Use Case (UC3) was conducted on May 15th, 2025, at Station CF Galati Brates, Romania. Partners EBOS and BEIA prepared for two months and performed site-surveys to optimize sensor configuration and network reliability.

Objective:

- Digitize border control for rail crossing between Romania and Moldova.
- Detect illegal trespassing and illicit cargo.
- Ensure real-time risk assessment and system effectiveness at two border stations.

Legacy Systems: None.

Demonstrated Components:

- Human Trafficking Detection (BEIA)
- Illicit Cargo Detection with blockchain and tracking (BEIA)
- Multimodal Pattern Detection (BEIA)
- UC3 Control UI integrating the above (BEIA)

The fully integrated toolkit demonstrated advanced detection capabilities and real-time alerting during the live trials. A rehearsal took place on May 13 and a formal presentation was held on May 14. Booklets and consent forms were provided. Attendees included the Project Officer and partners from ENG, ICCS, BEIA, EBOS, HOLO, WINGS, ATG, GIBP, TCCFR, IGPF, KEMEA, and HPOL.

Evaluation Results and User Feedback

Quantitative and qualitative evaluations revealed high satisfaction levels. Figure below illustrates user ratings using a green-to-red scale,

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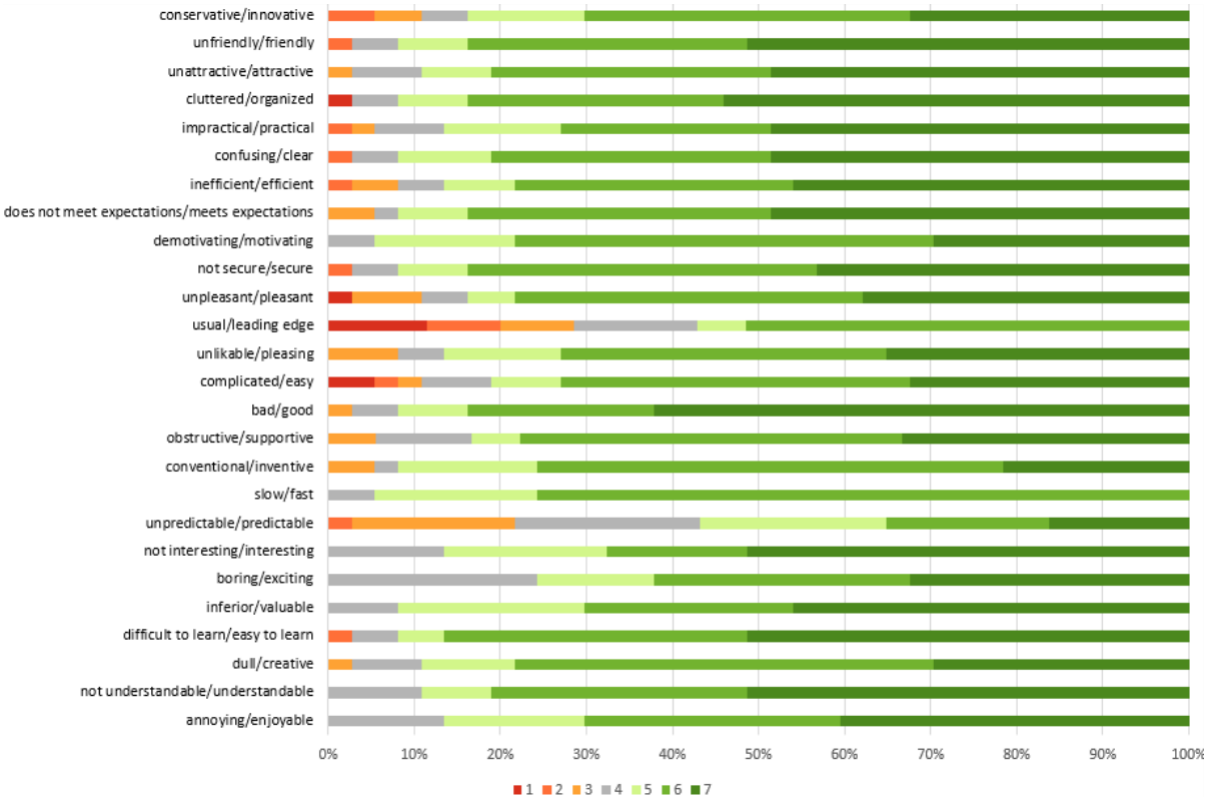

and Table below categorizes responses by attributes such as attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty.

Field		Category
Negative answer	**Positive answer**	
annoying	enjoyable	Attractiveness
good	bad	Attractiveness
unlikable	pleasing	Attractiveness
unpleasant	pleasant	Attractiveness
attractive	unattractive	Attractiveness
friendly	unfriendly	Attractiveness
unpredictable	predictable	Dependability
obstructive	supportive	Dependability
secure	not secure	Dependability
meets expectations	does not meet expectations	Dependability
fast	slow	Efficiency
inefficient	efficient	Efficiency
impractical	practical	Efficiency
organized	cluttered	Efficiency
creative	dull	Novelty
inventive	conventional	Novelty
usual	leading edge	Novelty
conservative	innovative	Novelty

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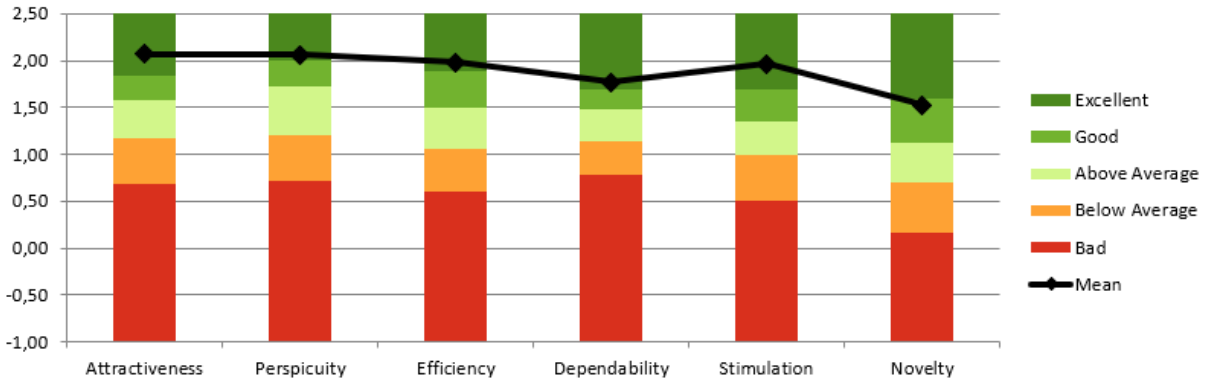
not understandable	understandable	Perspicuity
easy to learn	difficult to learn	Perspicuity
complicated	easy	Perspicuity
clear	confusing	Perspicuity
valuable	inferior	Stimulation
boring	exciting	Stimulation
not interesting	interesting	Stimulation
motivating	demotivating	Stimulation

The final results shown in figure below showed a clear trend toward “excellent” and “good” across all attributes.



Key Insights from End-Users:

- "We live in a technological world; border controls should meet the new expectations!"
- "The FLEXI-CROSS project demonstrates strong technical maturity and alignment with EU policy."
- "As a border officer, this solution boosts both security and traveller experience."
- "The integration of visual analytics, drones, CO_2 sensors, and mobile apps is groundbreaking."
- "The UI is helpful but could be improved for non-technical users."
- "Real-time alerting and system interoperability are key advantages."

Overall Satisfaction:

- FLEXI-cross met operational requirements and showed high adaptability.
- It enhanced border control processes while aligning with EU strategic goals.
- It is seen as a forward-thinking, practical, and scalable solution for modern border management.

Recommendations:

- Further improve UI for users without technical backgrounds.
- Implement immediate alert visualization with comprehensive details for Command Centre operatives.

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Conclusion

The successful execution of the three final trials for the FLEXI-cross project marks a significant milestone in the modernization of border control systems across the EU. With strong end-user validation, integration of cutting-edge technologies, and alignment with European policy objectives, FLEXI-cross sets a new standard for secure, efficient, and scalable border control operations.

More information about the project can be obtained from the project website and social media networks.

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