

FASTER NEWSLETTER

#6



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IN THIS ISSUE

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03 FINAL CONSIDERATIONS ON FASTER PROJECT

05 FASTER PILOTS AND DEMONSTRATIONS

07 THE FUTURE OF FASTER

FINAL CONSIDERATIONS ON FASTER PROJECT

“ The FASTER project is going to be concluded. The long trip lasted 36 months is approaching his last mile and it is time to make a final assessment from the research and innovation point of view. ”

We started with the definition of the first and second version of the FASTER System Architecture, respectively at M12 (April 2020) and M24 (April 2021) presented from three different perspectives:

- the FASTER Logical Architecture,
- the FASTER Cloud-based Infrastructure and
- the FASTER Interoperability and Deployment approaches.

The FASTER Logical Architecture was modelled as a three layer architecture, namely INTERNET, FOG and EDGE, so as to separate tools, services an application to enhance respectively the global, local and personal situation awareness.

Starting from the updated list of user requirements (D3.2 – User Requirements and Definition of Use Cases v2) and the functional and non-functional system requirements (D3.4 – Technical Specifications v2) a set of 27 FASTER architectural modules and their related components were identified and defined.

During the second year of the project lifecycle, 18 innovative FA-



A drone in action during the Polish pilot in march of 2022

STER tools and services were developed by 12 technological partners (ENG, UniWA, CERTH, ROB, DH, CS, LINKS, KAMK, INOV, SYN, KGU, OTE) taken into consideration the IFAFRI (International Forum to Advance First Responder Innovation) guidelines and its main aims. One of IFAFRI strategic objective is to identify common capability gaps that pinpoint and prioritize areas that can benefit from new or improved solutions for first responders. The mission is to identify and prioritize first responder capability gaps.

It is worth mentioning that the following FASTER innovative tools and technologies covered all the 10 IFAFRI Capability Gaps, aiming at increased situational awareness, risk assessment and anticipation, autonomous vehicles, K9s and personal UAVs, resilient communication.

- Augmented reality (AR) app for increased situational awareness, displaying the user's live position on a minimap and creating, visualizing and sharing points of interest.
- Augmented reality drone control application, sharing the drone's position and status with the Common Operational Picture (COP), creating shared points of interest, controlling unmanned vehicles with gestures, as well as live streaming the drone's camera feed to the COP and the video display in AR.
- Automated drone mapping tool, which directs one or more drones to scan a selected area, creates a map from the resulting photographs, and displays it on the COP.
- Suite of AI scene analysis algorithms that detect victims, vehicles, and other features of interest in the map or from individual photos.
- Smart textiles framework that tracks a wearer's position and biometrics, and shares them with the COP.
- Animal wearable that simi-

larly tracks rescue dogs and posts their position on the COP.

- Framework for gesture-and-wearable-based communication, allowing haptic communication within a team or with the COP.
- Mission management tool to create and coordinate missions and organize the deployment of resources, including a chatbot application to allow responders and volunteers to accept missions, report their status and activity, and post text and multimedia reports.
- Common Operational Picture (COP) is the backbone of the FASTER tool suite and provides both a user-friendly dashboard to aggregate mission-relevant information and an interactive interface for a number of connected tools. The COP is a web-based application for improving situational awareness while handling the disaster scene's critical situation. It collects, normalizes, and visualizes all the data arriving from the heterogeneous connected tools to create an overall situational picture in a single dashboard. COP is operative with or without an Internet connection. It is accessed using a secure login and is provided, with different privileges, to both the incident commanders operating at the control centre (C2) and the team leaders or FRs operating on the field, to give them a clear perception of the disaster scene. Leveraging on the inputs coming from project components, the COP provides a detailed picture of a current situation, even updated in real-time, in the area affected by the hazard, preserving FR safety and mitigating the consequences of a disaster more efficiently.

Most of them were also demonstrated and evaluated in 3 main pilots:

- Natural disaster (flooding) Moncalieri IT (8 tools)
- Natural disaster (earthquake) Madrid ES (14 tools)
- Man-made disaster (terrorist attack) Kajaani FI (12 tools)

In addition, to mitigate the impact of the COVID-19 restriction and limitation, 5 additional (extra) pilots were added:

- Earthquake Grandola PT (6 tools)
- Fast and focused SAR Athens GR (9 tools)
- Earthquake Miki JP (5 tools)
- Fire building Paris FR (8 tools)
- Missing person Szczytno PL (5 tools)

During the piloting, in order to decrease latency and network congestion, FASTER tools made use of FOG computing, which is an extension of cloud computing services located closer to the EDGE of the network. Both cloud and FOG offer similar resources and services, the latter is characterized by low latency with a wider spread and geographically distributed nodes to support mobility and real-time interaction.

Finally, the connection point between the EDGE and the FOG layer, along with the connection point between the FOG and the INTERNET layer was analysed as the main interoperability issue. Technologies, APIs, and an initial JSON schema were proposed.



K9 unit during the spanish pilot in Madrid, 2022

FASTER PILOTS AND DEMONSTRATIONS

As the FASTER project comes to an end, we take a look back at all of the events hosted by project partners. The trial and final demonstrations, held at the halfway and the end point of the project, but also the seven additional pilot activities organized to overcome the barriers that COVID introduced – in particular, travel restrictions.

FASTER's tools aim to help first responders do their work safer and more efficiently. The tools are developed keeping in mind the challenges responders face while working in high-urgency situations, in disparate environments, both indoors and outdoors, with large or small affected areas, in extreme conditions, and often with difficult-to-navigate terrain.

The project's ultimate goal was, having learned the needs and wishes of end users, that technical partners develop innovative, useful, (relatively) easy-to-use tools to improve the capabilities of responders. Even when facing COVID-related obstacles, the consortium partners continued to actively engage in adapted ways, collaborating regularly to ensure continued exposure to the tools and opportunities for feedback. Examples are:

- Remote tool demonstrations: hardware and/or software tools sent to end users, even with the technical partners could not travel.
- Online events: live streaming of pilots, demos of individual tools, training sessions, and evaluation sessions regularly took place online
- Local clusters: In-person training between technical partners and end users located in

the same country/geographical region.

Most remarkably, partners worked together to successfully organize seven additional piloting events, not originally foreseen in the project agreement. These events often took advantage of local clusters – FASTER is fortunate to have two or more partners in several countries. The extra pilots vastly increased FASTER's exposure, as end users often invited many local stakeholders to participate. In addition to the pilots, an EU-Japan International Symposium, organized over five days, allowed for fruitful information exchange between groups of responders as well as technical developers.

Below is a summary of all of the pilots, demonstrations, and

symposium events held within the FASTER project. The local hosts worked with other participants to shape these events, each of which was unique in terms of specific scenario, location, combination of tools, objectives, and stakeholder participation. The collaboration within the FASTER consortium was exceptional. Despite pandemic-related challenges, partners showed incredible adaptability in keeping and even exceeding the project's original ambitions.

Organizing more than twice as many events as originally planned and truly maximizing the exposure of the tools, offering responders hands-on experience and gathering – an incorporating – feedback resulted in the further development of tools that responders would like to adopt into their important, challenging work.



An aerial view of the Italian pilot location on the Po river near Turin

1/2021 & 01/2022	Italy	Scenario: Major flooding	Held in Piedmont Region, and based on a real-life flooding event that mainly affected the southern and western part of Piemonte, involving the Cuneo, Asti, Alessandria and Torino districts, particularly the town of Moncalieri. The scenario included pre-event preparations and evacuation in the days and before, the peak of the flooding and rescue efforts, as well as the post-event operations.
3/2021 & 3/2022	Finland	Scenario: Terrorism & explosion in smart building	The Lehtikangas School is a modern building, allowing FASTER tools to be used in conjunction sensors already located within the building. Multiple critical events were incorporated into the scenario, including wounded persons, possible explosives, fire threat, and a perpetrator threat.
11/2021 & 4/2022	Spain	Scenario: Major earthquake	Organized by ESDP (K9 team), SUMMA (medical response), Madrid Police, Madrid firefighters (CBCM), these demonstrations provided a test of FASTER technologies in a COVID-19 risk environment, in line with extra precautionary measures to be taken by responders. They focused on the operational phase of a response, including on-site search and rescue work and mission coordination.
10/2022	Greece	Pilot: earthquake, and network failure	Held at an abandoned mining site, this was the project's first piloting event, organized to test the integration and interoperability status of the tools at an early stage, and demonstrate them to the hosts, the Hellenic Rescue Team Attica.
05/2021	Portugal	Pilot/Evaluation workshop: fire, network breakdown	The pilot site for this evaluation was an industrial area close to the urban perimeter of Grândola, a municipality in southern Portugal. This workshop was held in a hybrid form, with both physical and remote presence of FASTER tools. Using a combination of live demos, simulated data, presentations and videos, several tools could be included.
07/2021	Japan	Trial Pilot: search and rescue operations following an earthquake with resulting fire and debris	Held in Miki, northwest of the Japanese city of Kobe, Following a scenario of an earthquake and resulting fire and debris, this one-day event took place in the Hyogo Prefectural Disaster Management and Training centre. This event was led by FASTER's technical partner, Intelligent Blockchain+ KGU, whose efforts to connect with the local responders to organize this event cannot be overstated.
10/2021	Spain	Pilot: earthquake	Took place in and around a former oncology hospital in Villaviciosa de Odón, (15km west of Madrid). There are semi-collapsed structures present on the site, making for a fitting training ground for earthquake scenarios
10/2021	Greece	Pilot: assessment and early rescue phases following earthquake	Hellenic Rescue Team Attica (HRTA) worked with involved technical partners to create use cases for their tools. Within the overarching context of an earthquake, HRTA created three mini-scenarios: 1. wide-area assessment 2, focused area assessment, and 3 focused indoor assessment.
11/2021	France	Pilot: fire and chemical hazards, divided into 4 workshops	Hosted by the French Academy for Fire, Rescue and Civil Protection Officers (ENSOSP), an overarching scenario was divided into four workshops. Each focused on different aspects, different levels of operation, and involved different (combinations of) FASTER tools
3/2022	Poland	Pilot: missing person in a wooded area	The Police Academy of Szczytno organized and hosted this event, involving many stakeholder groups, and based on a scenario that is very relevant to their work. The dense woods are a challenge, and ariel views are difficult to achieve, and real time information sharing
3/2022	Japan – EU	EU-Japan Symposium on Advanced Technologies for First responders	Professionals from technical, practitioner, academic, and industry backgrounds from Europe, Japan, and Korea gathered to discuss and share advances in technologies for use by first responders in major man-made and natural disasters. Originally planned in person, COVID prevented travel to Japan, and the event was held completely online. Because of the timezone differences, the event was comprised of prerecorded (asynchronously) and live (synchronously) segments, spread over five days. It included prerecorded keynotes and live panel discussions.

THE FUTURE OF FASTER

The FASTER project is a Research and Innovation Action, and this means it is not intended to generate outcomes that could be considered final products, but mainly prototypes, which are expected to grow into products in the next years. FASTER addresses the challenges associated with the protection of first responders in hazardous environments, while at the same time enhancing their capabilities in terms of situational awareness and communication. FASTER deals with this challenge following a dual approach that encounters the provision of:

- Methodological plans, operational procedures and services that support all the stakeholders involved in responding to emergencies and that are impacted by the use of the FASTER tools
- Innovative, accepted and efficient tools covering data collection, operational capabilities, risk assessment, improved ergonomics, resilient communication, tactical situation awareness and efficient cooperation and interoperability

The FASTER Exploitation Route aims at enabling an active use of the results created to multiply the impact of the potential solutions and to prepare the transition towards commercial uptake. The key aim is to define a concrete exploitation strategy to prepare the grounds for the future exploitation of project main results, both at individual partners' and at Consortium level.

16 FASTER's Key Exploitable Results (KERs) have been analyzed and exploitation strategy detailed. It aims at enabling an active use of the exploitable results created by the project to generate positive impacts.

From the sustainability point of

view, it is important to consider the level and degree of acceptability of project results by the end-users. Weak acceptability by one or more of these end-users has the risk of compromising the long-term sustainability of the project. The FASTER sustainable emergency operations tool represents one of the project's main sustainable results that will be adopted by end users after the project end, essential to reinforce the FASTER sustainability concept.

In order to leverage on the cooperation between partners and to maximise the impact of the project, partners have decided to join their forces to build 2 Joint Exploitation Plans covering complementary KERs. These joint exploitation plans have been built to maximise the value proposition offered to the different targets while limiting the exploitation risks and maximising the probability to reach the market.

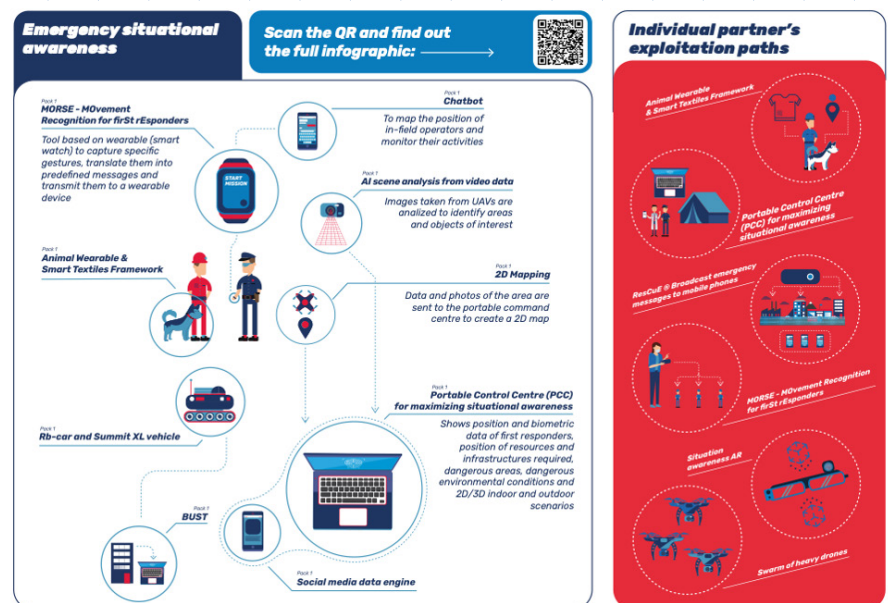
The FASTER next steps are the following:

- The real adoption of the FASTER's results from project

end-users.

Further product testing, carried out after the project completion, might be arranged.

- The expansion of the customers base and the introduction of the results for a broad audience.
- The further definition of clearly market actions along with the development of all the required action to tune the final products.
- In FASTER, it has been found useful to create Memorandum of Understanding (MOU) articulating the roles and responsibilities of various partners involved in a joint result. This agreement help ensure that partners continue to engage in collaborative work even after the project's end.



An image from the final infographic reported on the faster dissemination leaflet



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