

5G-HEART Newsletter

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5G HEART
5G Health, Aquaculture and Transport
Validation Trials

Project website: <https://5gheart.org/>

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1. 5G-HEART has been completed

After three and half years of hard work on 5G health, aquaculture and transport validation trials, the 5G-HEART project officially ended on 30 November 2022. In the end of the project, a set of final technical and dissemination deliverables has been published at the 5G-HEART project website, providing a detailed view into the technical results and impact of the project.

This last issue of the 5G-HEART Newsletter provides a short overview of the final deliverables with direct links to the public PDF version of these documents. The 5G-HEART project consortium believes that the reported results are of interest to the different stakeholder groups in telecom, healthcare, transport and aquaculture industries as well as to the European research community and general public at large.

The trials implemented and conducted during the 5G-HEART project have been able to show the potential of the 5G technologies in enabling new innovative digital services in the targeted vertical domains. In addition, they have clarified the pathways for many of the tested service concepts to move from research trials and pilots towards scalable deployments over commercial 5G networks.

2. Final technical deliverables

Four technical deliverables were published in the end of the project presenting the implementation details and results of the 5G-HEART vertical trials.

D3.4 - Final solutions for healthcare verticals use of 5G

Deliverable D3.4 describes the final solutions used in the Phase 3 trials of the healthcare vertical use cases in the 5G-HEART project. The Phase 3 healthcare vertical trials have been performed per subcase, coordinated by the subcase owners, and using the 5GTN, 5G-VINNI, 5G-EVE, 5Groningen, Eindhoven and Grenoble trials platforms, as well as commercial networks. The emphasis of D3.4 is on the complete technical description of the final solution for testing.

The overall conclusion from the presented implementation work is that the 5G-HEART project has been able to address and implement experimental setups for nine different subcases within the healthcare vertical. Even though not all setups have been connected and tested using 5G connectivity, the feasibility has been proven for all, thanks to a committed cooperation between expert groups from the telecom area, the health technology industry, and clinical experts. Some of the subcases can be close to commercialization, provided that the stakeholders manage to forge the right partnerships. Others are still in an early exploratory phase and require further research and development of a partnership model.

Deliverable D3.4 is available at https://5gheart.org/wp-content/uploads/5G-HEART_D3.4.pdf.

D4.4 - Final solutions for transport verticals use of 5G

Deliverable D4.4 describes the final (Phase 3) trials setup, key metrics (application-level) and final solution designs developed in support of various use case scenarios of the transport vertical. The final Phase 3 implementations and solutions described in D4.4 have been mainly deployed and trialled over 5G SA, supported by the various partner's testbed facilities. The deliverable contains the final Phase 3 solutions adopted for the transport vertical use cases as well as the final trial setups and application-level results.

In order to achieve in-depth validation of the identified key 5G functionalities for the use cases, five core scenarios were selected as the main focus of the transport vertical. The large-scale implementation and trialling work was mainly performed under these five core scenarios. In parallel with the core scenarios, seven supplementary scenarios were also trialled in a smaller scale with a focus on specific technology enablers, helping to extend the knowledge gained from the large-scale trials of the core scenarios.

Deliverable D4.4 is available at https://5gheart.org/wp-content/uploads/5G-HEART_D4.4.pdf.

D5.4 - Final solutions for aquaculture verticals use of 5G

Deliverable D5.4 presents the results from the Phase 3 trials of the aquaculture solutions, and the testing and verification methodologies that are used for the two pilots during Phase 3. Two pilots were deployed, one in Greece and one in Norway, to cover different requirements that exist in two completely different environments. In D5.4 the final setup of the aquaculture trials for both the user applications and the network architectures are described for five trial scenarios by using the 5G-EVE, 5G-VINNI and commercial networks. Recommendations for the outcomes from the scenarios are also provided.

The results of trial scenarios have shown significant outputs showing that the 5G network is needed to support the high bandwidth which is required to transfer the high bit uplink rates from all cameras installed in the fish cages. The sensors and the underwater cameras enable proper monitoring of the water quality and fish health at the sites, less feed is needed to achieve the same weight gain with the use of the underwater system, and faster weight gain can be achieved with the use of cameras resulting in early harvesting. The use of camera also enables the user to keep track of fish behaviour resulting in disease prevention and reduction in mortality rates. As a end results, higher fish weight can be achieved by using less feed in the same time period.

Deliverable D5.4 is available at https://5gheart.org/wp-content/uploads/5G-HEART_D5.4.pdf.

D6.4 - Technology evaluation

Deliverable D6.4 describes the final trials of the 5G-HEART project and technology evaluation across the three verticals (healthcare, transport and aquaculture) and five 5G test facilities (5GTN, 5Groningen, 5G-VINNI, 5GENESIS, 5G-EVE). The document provides a detailed description of the test cases that were performed in the 5G trial activities including the methodology used for each experiment and the final assessment of the collected KPIs.

Overall, from the analysis of the test cases it was noticed that 5G technologies outperformed the baseline, meeting most of the network requirements of the different vertical scenarios. The measured KPIs were different in the various facilities, due to the different network characteristics. Moreover, there were some abnormalities due to the heterogeneous deployment of 5G network components across the used facilities (4G, 5G-NSA, 5G-SA, commercial 5G). For the scenarios that require ultra-low latency (less than 5ms), i.e., URLLC-type slices, only 5G-SA networks will be able to meet the targets. The evolution towards 6G will provide cloud-computing capabilities within the RAN closer to the end users. Therefore, with the advent of this technology, which, among others, focuses on and encapsulates edge computing, the applications with lower latency requirements as well as higher device density (e.g. IoT) will benefit the most.

Deliverable D6.4 is available at https://5gheart.org/wp-content/uploads/5G-HEART_D6.4.pdf.

3. Final dissemination deliverables

Three additional deliverables were published to summarise the main dissemination outputs towards the end of the project.

D7.3 – Project dissemination materials

Deliverable D7.3 summarises the general dissemination materials produced during the project. The dissemination materials presented include the printed materials in the form of project leaflets, roll-ups and key results booklet as well as the online materials in the form of project's public deliverables, newsletters and vertical trial videos.

Deliverable D7.3 is available at https://5gheart.org/wp-content/uploads/5G-HEART_D7.3.pdf.

D7.6 – 5G-HEART showcases

Deliverable D7.6 summarises the public showcasing and demonstration efforts realised during the project. The provided information includes the titles of the events where the demonstrations have been held and short descriptions of their content, excluding the 5G-HEART Final Event, which is summarised in deliverable D7.7.

Deliverable D7.6 is available at https://5gheart.org/wp-content/uploads/5G-HEART_D7.6.pdf.

D7.7 – 5G-HEART final event

Deliverable D7.7 shortly summarises the public 5G-HEART Final Event held in Oulu, Finland on 17 November 2022. The document includes an overview of the event agenda and presentations given at the event's main stage as well as at the use case specific booths. In addition to the presentation overviews, the demonstrations held at the booths are summarised for the project's three target verticals.

Deliverable D7.7 is available at https://5gheart.org/wp-content/uploads/5G-HEART_D7.7.pdf.

4. Summary

This last issue of the 5G-HEART Newsletter listed and shortly introduced the final deliverables, which focus the technical results and impact of the 5G-HEART project. Using the provided direct links to the public PDF versions of the deliverables, the interested readers can download the full versions of the documents to access the detailed information summarised in this newsletter.