

## SME Success Story – June 2021



### WINGS ICT Solutions

The WINGS success stories are related to the engagement in international cooperation, including H2020 and 5G PPP projects. Through these activities, and especially, 5G PPP, vertical solutions that leverage on advanced wireless technologies have been conceived, while contributions have been made for the development and validation of various technology components.

WINGS has success stories in all the main vertical areas that it addresses: utilities, food security, smart city applications, and industry / logistics.



Figure 1: WINGS Smart Parking device deployed at AIA

In the area of **utilities & infrastructures**, WINGS is deploying its smart parking solution at Athens International Airport in the context of 5G-TOURS and at a municipality in Central Greece. The WINGSPARK solution provides the means for effective real-time monitoring and management of on-street parking slots, municipal as well as private parking lots. The technology foundation comprises IoT (Internet of Things) parking devices with embedded intelligence able to detect the presence of a vehicle with high reliability, a cloud-based platform enabling real-time monitoring and management and algorithms for forecasting of parking availability as well as a mobile application for the drivers. The WINGSPARK mobile application aims at enhancing the user experience by providing useful insights for parking spaces occupancy and trends when searching for a parking spot, while reducing unnecessary driving and thus fuel consumption and CO<sub>2</sub> emissions. The solution is also integrated with third party components such as ANPR cameras, LED displays, barriers and payment kiosks.



Figure 2: Camera to be installed underwater, for monitoring the production, and to transmit through cabling and 4G/5G.

In the area **production and manufacturing**, 5G enabled the enhancement of the WINGS offering in **aquaculture**, namely the capabilities of the

AQUAWINGS platform, through the **5G-Heart** project. Streaming of many and high quality and drone manipulation was enabled by **5G**. More specifically, WINGS ICT Solutions is producing a prototype product in the aquaculture area for maximizing the growth rate, minimizing the feeding costs and monitoring the health of fish. The AQUAWINGS platform has been constructed for the above purpose based on the 5G-HEART project obligations. The platform has already shown significant results through its dashboard with which a fish farmer can monitor the growth and health of fish. The platform consists of a number of sensors, a camera and a drone for monitoring the underwater environment, is powered by photovoltaic panels and transmits the data through a 5G network infrastructure. The WINGS platform is shown in Figure 2.



Figure 3: WINGS “Remote vehicular monitoring & control” platform user interface

In the **area production and manufacturing**, 5G enabled WINGS to design and deliver services in the area of **Transport & Logistics**. WINGS has developed a platform and On-Board Units (OBUs) delivering cutting edge functionalities for the automotive/transport sector, while additional functionalities targeting logistics processes optimization are

currently being added. In the **Transport** sector, working alongside COSMOTE, TURKCELL and FORD, WINGS has developed a “Remote vehicular monitoring & control” platform which delivers advanced functionalities such as **Driver and Cargo remote monitoring & vehicle control override, remote inspection and risk assessment for customs operations, Vulnerable Road User (VRU) protection and green driving support**, utilizing 5G/IoT connectivity and predictive analytics based on advanced AI/ML solutions. The WINGS platform, which also supports service level continuity for cross-border operations, has been developed within the context of the 5G-MOBIX<sup>1</sup>, 5G-CARMEN<sup>2</sup> and 5G-ROUTES<sup>3</sup> Horizon projects, and will be showcased in real-life trials at the Greek-Turkish borders in Q4 2021.

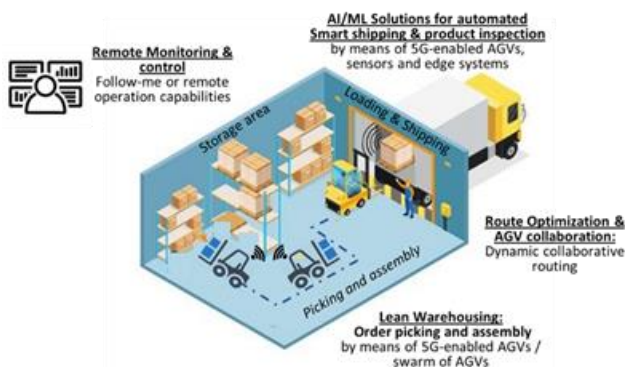


Figure 4: WINGS “Remote vehicular monitoring & control” platform user interface

For the **Logistics** sector, WINGS develops solutions for the smartification of warehouse operations and the optimization of end to-end logistics processes such as **end-to-end cargo tracking & status monitoring, delivery route optimization, seasonal storage optimization, automation of storing, picking and shipping processes through the use of Automated Guided Vehicles (AGVs), Human-AGV collaboration and autonomous product quality assurance**. WINGS is developing these functionalities,

<sup>1</sup> H2020-ICT-18-2018 5G-MOBIX, <https://www.5g-mobix.com/>

<sup>2</sup> H2020-ICT-18-2018 5G-CARMEN, <https://5gcarmen.eu/>

<sup>3</sup> H2020-ICT-53-2020 5G-ROUTES, <https://www.5g-routes.eu/>

in the context of its participation in the VITAL-5G<sup>4</sup>, DEDICAT 6G<sup>5</sup> and Hexa-X<sup>6</sup> Horizon projects, and is utilizing advanced technological concepts such as warehouse digital twin, AI/ML predictive resource utilization & predictive maintenance, geofencing and more.

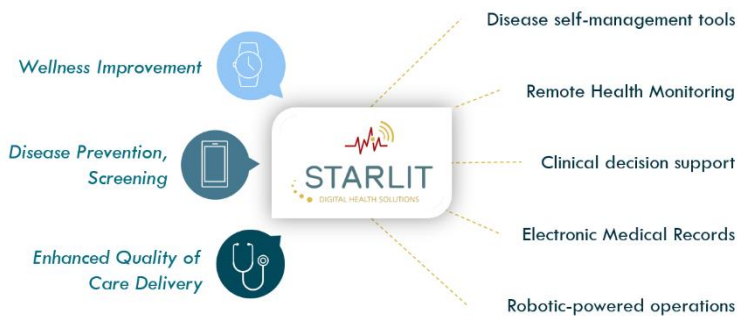


Figure 5: WINGS offering through STARLIT platform.

In the area of **service** sectors, WINGS offerings in **healthcare** domain have been drastically enhanced. This has been achieved through a modular product suite titled **STARLIT** (Solutions for digital health and wellness based on artificial intelligence and IoT), designed and developed by WINGS to provide support for wellness and digital health issues. **STARLIT** platform is based on AI, IoT, mobile and wireless

technologies (4G, Nb-IoT, 5G, Wi-Fi), visualisation and security, including dashboards, mobile applications, and AR/VR<sup>7</sup> applications in some cases.

**A remote health monitoring and emergency situation notification and optimal ambulance routing system** is delivered through STARLIT in the scope of **H2020 5G-TOURS** project. The main aim is to address solutions for remote health monitoring of people, especially when already diagnosed with a critical disease still compatible with home care (some form of cardiovascular disease, hypertension, diabetes, etc.). The system allows real-time data collection and visualisation of the main vital signs and includes intelligence for the identification of current and forecasting of future health issues. In case of identifying potential abnormalities, emergency notification/alerts are raised, and this, triggers, when necessary the dispatching of an ambulance and optimal ambulance routing showcasing real time navigation of the ambulance to ensure the timely provision of medical help and immediate patient immediate transfer.

In the **H2020 5G-HEART** project WINGS is delivering, among others, a **remote health monitoring system for workers in the aquaculture industry**. STARLIT aims at mitigating the hazards and risks for aquaculture workers providing real-time monitoring and constant situational awareness of their health status and environment. Workers are equipped with wearable devices measuring major vital signs and supervisors and/or professional caretakers with smart glasses, to remotely provide additional insights to the medical experts. Thus, they can be informed on the health status of the workers being monitored with the appropriate alarms raised if necessary, be on alert if the system identifies any abnormality in usual patterns or forecasts time periods with increased risk and improve their work due to the automated decision making and the direct communication from the dashboard and the smart glasses, the forecasting and visualization techniques.

<sup>4</sup> H2020-ICT-41-2020 VITAL-5G, <https://www.vital5g.eu/>

<sup>5</sup> H2020-ICT-52-2020 DEDICAT 6G, <https://dedicat6g.eu/>

<sup>6</sup> H2020-ICT-52-2020 Hexa-X, <https://hexa-x.eu/>

<sup>7</sup> AR: Augmented Reality, VR: Virtual Reality

Through our work in the **H2020 DeepHealth** project we deliver solutions for the prediction of migraines, seizures, and the progression of depression, while also exploiting the capabilities of High Performance and parallel computing.



Figure 6: MigraineNet mobile application.

The **MigraineNet** mobile application (US patent No: 10,943,696 B2) is a tool for migraine self-management developed by WINGS. The main features offered include: (a) easy recording of a migraine incident and its causes by the patient, (b) collection of statistics about the nature of the migraine incidents, their frequency and their weekly distribution, which can be used by the doctor to assess the patient's health status, and (c) prevention or mitigation of the strength of the next migraine incident via its prediction up to one week in advance. With the

support of Hellenic Headache Society, MigraineNet was used by 75 real patients, who recorded 875 migraine incidents, from which useful insights were extracted about the nature of the incidents and the strategies followed by the patients to alleviate the migraine's pain. These observations are very helpful for the doctors to better understand the clinical condition of the migraineurs. The application uses four different AI models, which were able to predict the occurrence or not of a migraine incident with accuracy up to 73%, making MigraineNet a suitable tool for migraine prediction.

For the prediction of seizures predictive models for **Electroencephalograph (EEG)** signals and a user interface for visualization purposes (signals, training models, inference/notifications) have been developed. A web application that incorporates various digital questionnaires is also being developed in cooperation with psychologists from Otto von Guericke University Magdeburg (OVGU) in order to deliver a solution for assessing the status of subjects with predisposition or symptoms of depression providing further insights to the medical experts.

In the same area, WINGS is also delivering advanced **Electronic Medical Records (aEMR)** and accompanying tools and functionalities (administration tool, database configuration and e-shop) to be adopted by clients from diagnostic units and healthcare settings.

Finally, in the H2020 5G-ERA project, WINGS will use robots equipped with various sensors (audio, visual, signal, etc.) and cameras, complemented by AI algorithms for real-time situational response and decision-making, in order to support healthcare and Public Protection and Disaster Relief (PPDR) use cases.

WINGS digital healthcare solutions are shaping the future of digital healthcare in Greece and abroad.

WINGS is honoured to be part of the journey of shaping emerging and future networking / cloud / application technologies, in cooperation with its partners, including world renowned multi-nationals, for the benefit of the European industry and citizen, while also having an eye to the world.