



DOWNSTREAM GATEWAY
Space for Earth

Positioning Navigation and Timing for Intelligence Health

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- ❑ Positioning Navigation and Timing is entering more and more in our daily lives of citizens and in many sectors of our economy. This significant increase is based on the availability GNSS providing PNT with high accuracy, available anytime everywhere, free, user friendly without need of any additional infrastructure.
- ❑ The increasing market is linked with the development and use of Galileo which provides additional features
Open Service Navigation Message Authentication
- ❑ GNSS user technology is now widely available in mass market devices including wearable personal devices, connected vehicles, Internet of Things (IoT) objects, etc.



□ Different segments of applications:

- Mass market solutions
- Transport safety and liability critical solutions
- High precision, timing and asset management solutions

□ New generation of intensive information Location Based Services (LBS) is growing to support highly-scalable pervasive applications where large number of geographically-distributed users are engaged.



- ❑ **The digital revolution is reshaping our everyday life, along with the business models and processes of companies. Economy and society are changing fast and deep: climate change, shared economy, silver population.**
- ❑ **These changes bring opportunities and challenges for AI, connectivity, big data, digitalisation, mobility**
- ❑ **As these “macrotrends” lead to the development of new information-intensive services, impacting the adoption of GNSS solutions when these services require positioning and timing data on a global scale.**



The macro trends in health

- ❑ The silver population
- ❑ More and more people are in demand for health care services
- ❑ Access to public health in rural areas



- ❑ Improving Health for everyone everywhere implies health sector is turning towards digitalisation
- ❑ Towards the adoption of new digital person centric solutions to deliver proper, accessible, affordable services and new healthcare and wellness products.

Mobile Health

IoMT

Telemedicine



Healthier population

Health emergency

Health coverage



- ❑ **The majority of services require positioning and timing data on a global scale and are enabled by GNSS.**
- ❑ **Leveraging its capabilities in Navigation on EGNOS and Galileo, the Programme NAVISP addresses GNSS based PNT solutions in the wide spectrum of applicable sectors**

Element 1: innovative technological trends identified by ESA

Element 2 competitive products identified by industry

Element 3: strategic projects identified by the Participating State



- ❑ **The innovative and competitive PNT solutions improve GNSS performance:**
 - **more accuracy**
 - **robustness to spoofing and jamming**
 - **ubiquity, continuity, availability**
 - **authentication**
 - **time to fix**
 - **limit power consumption**
- ❑ **This leads to a wide range of R&D for new downstream solutions that are based on GNSS but also include complementary information from other sources**



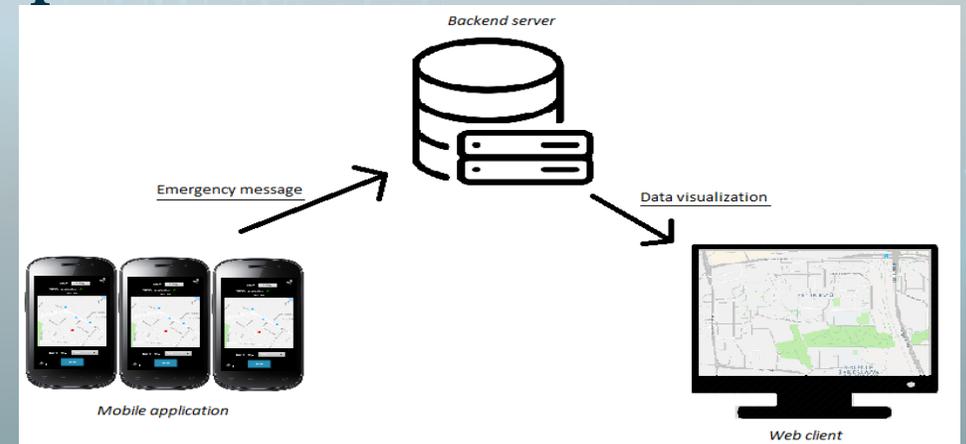
Some examples of NAVISP:

- **Enhancement of Maritime Search and Rescue service: the development of an emergency beacon combining in the same device a PLB (Personal Locator Beacon) function (406 MHz and 121.5 MHz) and also a AIS-MOB (Automatic Identification System – Man Over Board) function (156 MHz). The resulting compact waterproof hardware can be integrated into a life-vest.**



❑ Commercial applications aiming at creating advanced IT system

- for crises management efficiency in order to save the lives and health of the victims, ensure public safety and coordinate responses.
- for operations of medical emergency services by providing to a monitoring station the location and the basic medical information of a person with a cardiovascular implantable electronic device (CIED) who might be in an emergency situation.
- providing guidance to visually unpaired people where mobility and orientation is added to navigation



- ❑ GNSS has a fundamental role to support Intelligence Health
- ❑ Optimal solutions are obtained by integrating GNSS with other PNT sources to increase the resilience of the information
- ❑ NAVISP is the ESA programmatic framework to explore innovative solutions and develop competitive products : <https://navisp.esa.int>
- ❑ EMITS AO 10516, EMITS AO9427 and Element 1 ITT

Thank you!

