Healthcare and Smart/Green Hospital services

5GSC Healthcare Working Group
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Hospitals face multiple challenges

- Reliance on conventional fuels leads to **high operating costs and increased CO_2 emissions**, while climate change and more frequent heatwaves intensify energy needs and the environmental footprint.

- **Intelligent management of buildings, infrastructure, and mobility** (e.g., parking, vehicle flows) further puts a strain on daily operations and access to critical services.

- Additionally, **air conditioning and lighting control mechanisms** often rely on manual processes, resulting in energy consumption without substantial adaptation to the actual needs of patients and staff.

- Indoor **air quality** remains poorly monitored, resulting in the accumulation of pollutants that negatively affect health and increase the risk of infections.

- The lack of continuous **water quality control** and assurance systems increases the risk of contamination, while the lack of early **detection of leaks** leads to significant resource losses and financial burden.

7%
the *energy costs* of public hospitals in Greece out of their total budget 1

1/5 Greek hospitals have adopted *telemedicine technologies* and *remote monitoring systems* 2

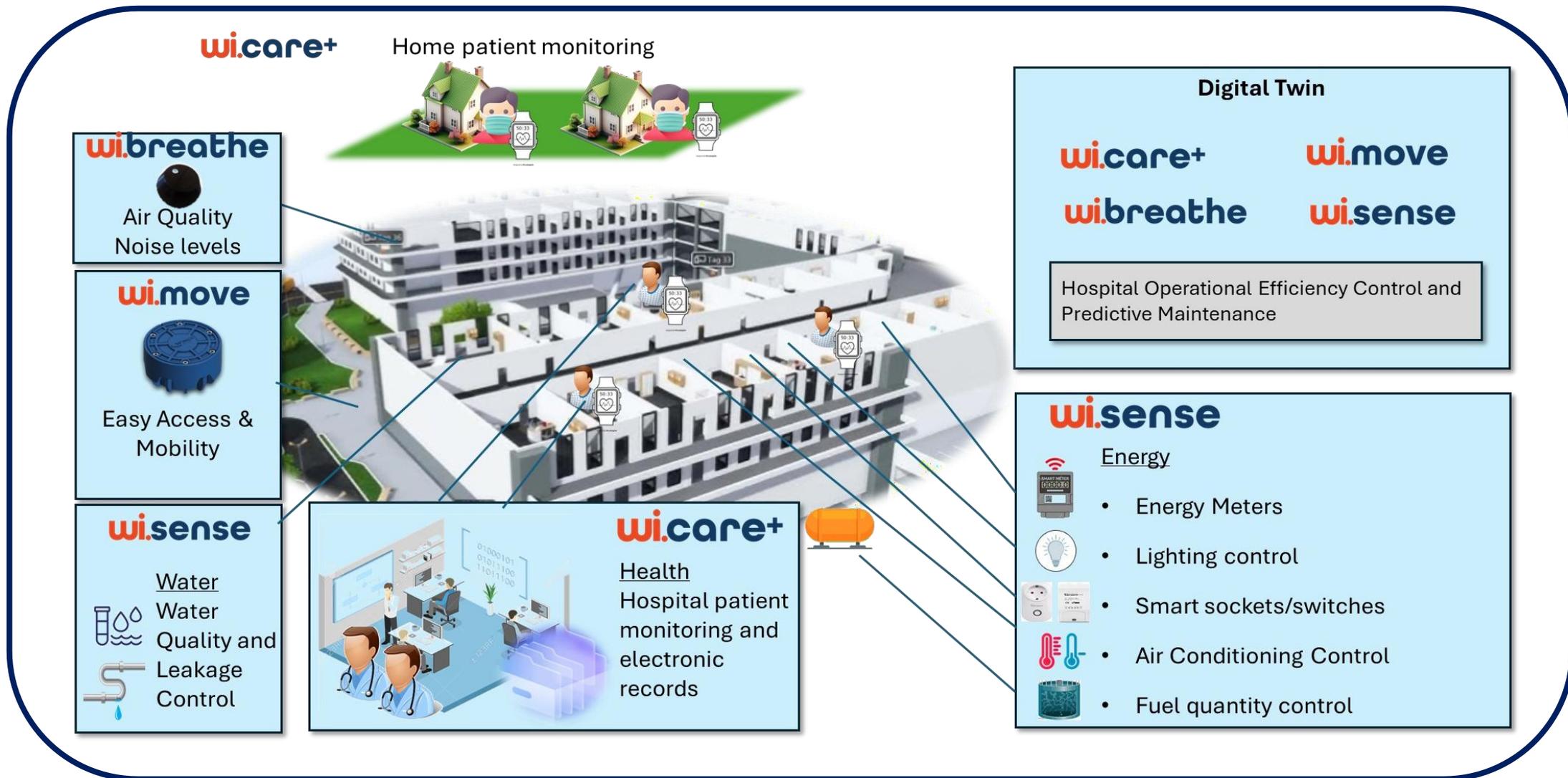63% the *operational efficiency* of *Greek public sectors Hospitals* 3

Zaza, P. N., Sepetis, A., & Bagos, P. G. (2022). Prediction and Optimization of the Cost of Energy Resources in Greek Public Hospitals. *Energies*, *15*(1), 381. https://doi.org/10.3390/en15010381

HealthManagement.org. (Mourtou, 2012)). Hospital Informatics in Greece. https://healthmanagement.org/c/it/issuearticle/hospital-informatics-in-greece?utm_source=chatgpt.com

Yfantopoulos, J., Athanassios Constantopoulos, & Athanasios Chantzaras. (2023). Dynamics of Efficiency and Productivity in the Greek Hospital Sector. Authorea (Authorea). https://doi.org/10.22541/au.169973883.36567103/v1

Solution: Smart Hospital

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- Creation of an integrated digital ecosystem that will enhance health services in hospitals, contributing to both the improvement of patient care and the overall efficiency of the organization to build a **holistically "smart" hospital**.

- **Smart Hospitals Infrastructure**
  - Infrastructure management systems that monitor and optimize energy consumption, air/water quality control, and noise reduction to ensure ideal conditions for patients and staff, air conditioning and lighting control, smart security and alert solutions, easy access and use of Digital Twins and IoT for timely monitoring and predictive maintenance of critical infrastructure and medical equipment. The aim is to reduce operating costs, ensure a safe environment for patients and staff, and improve the daily operation of the hospital.

- **Digital Health & Telemedicine**
  - Utilization of a telemonitoring and telemedicine platform, with capabilities for collecting and analyzing vital health signs, a dynamic electronic health record, real-time notifications and the possibility of home monitoring through smart devices. The goal is to enhance in-hospital care and expand support to patients remotely, reducing unnecessary visits and enhancing prevention.

WINGS offerings

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wi.care+ Home patient monitoring

wi.breathe
Air Quality
Noise levels

wi.move
Easy Access &
Mobility

wi.sense
Water
Water
Quality and
Leakage
Control

wi.care+
Health
Hospital patient
monitoring and
electronic
records

Digital Twin

wi.care+   wi.move

wi.breathe   wi.sense

Hospital Operational Efficiency Control and
Predictive Maintenance

wi.sense
Energy
- Energy Meters
- Lighting control
- Smart sockets/switches
- Air Conditioning Control
- Fuel quantity control

Healthcare applications for 5G-TRACE and 5G-SHEAL

In Hospital and remote health monitoring & emergency notification

- **Smart Wearables over 5G for Remote Oncology Monitoring**
  - Continuous monitoring at home
  - Low latency & real-time alerts
  - Support for oncology patients via prediction analysis
  - Pre-admission clinical assessment
  - Seamless integration with patient records

- **Portable ultrasound system for inpatients over 5G (Low Latency & High Resolution)**
  - Real-time high-resolution imaging
  - Remote expert support and second opinion
  - Safer interventional procedures
  - Point-of-care examination
  - Reliable performance in critical scenarios

- **Connected Defibrillator over 5G**
  - Immediate availability and rapid response
  - Real-time device monitoring and status reporting
  - Remote supervision and clinical support
  - High reliability in critical situations (low latency, guaranteed connectivity)
  - Integration with digital health platforms
  - Operational efficiency and compliance

Thank you

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