Panagiotis Demestichas
pdemestichas@gmail.com

WINGS ICT Solutions
pdemest@wings-ict-solutions.eu

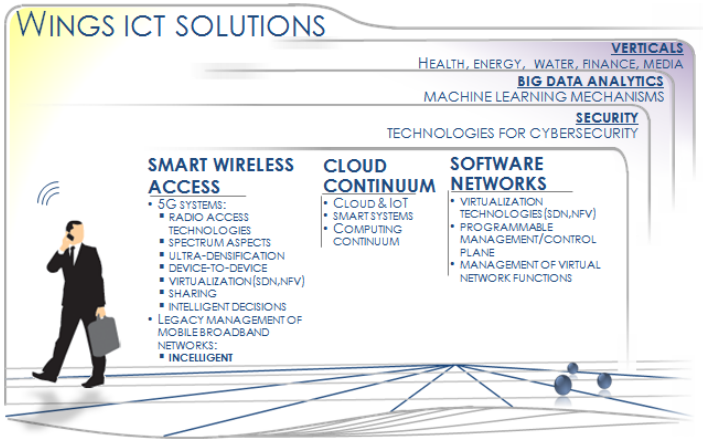
This presentation is for

- ☐ **Workshop 1** Big Data
- ☒ **Workshop 3** Photonics and Micro-and-Nanoelectronics
- ☐ **Workshop 2** Robotics
- ☐ **Workshop 4** internet of Things

Description of the Organization

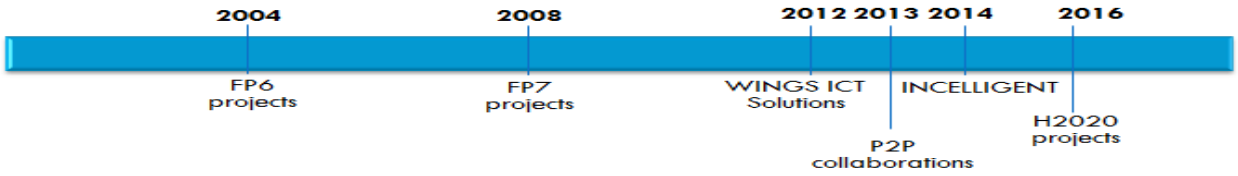
WINGS is a dynamic SME conducting research and development in areas related to telecommunication networks and services

- **Our Team:**
  - 5 Senior Business and Technical Development Strategists
  - 6 Senior Solution Architects (>10 years experience)
  - 8 Solution Architects (<10 years experience)
  - 11 Software developers
  - 20 Junior Software developers

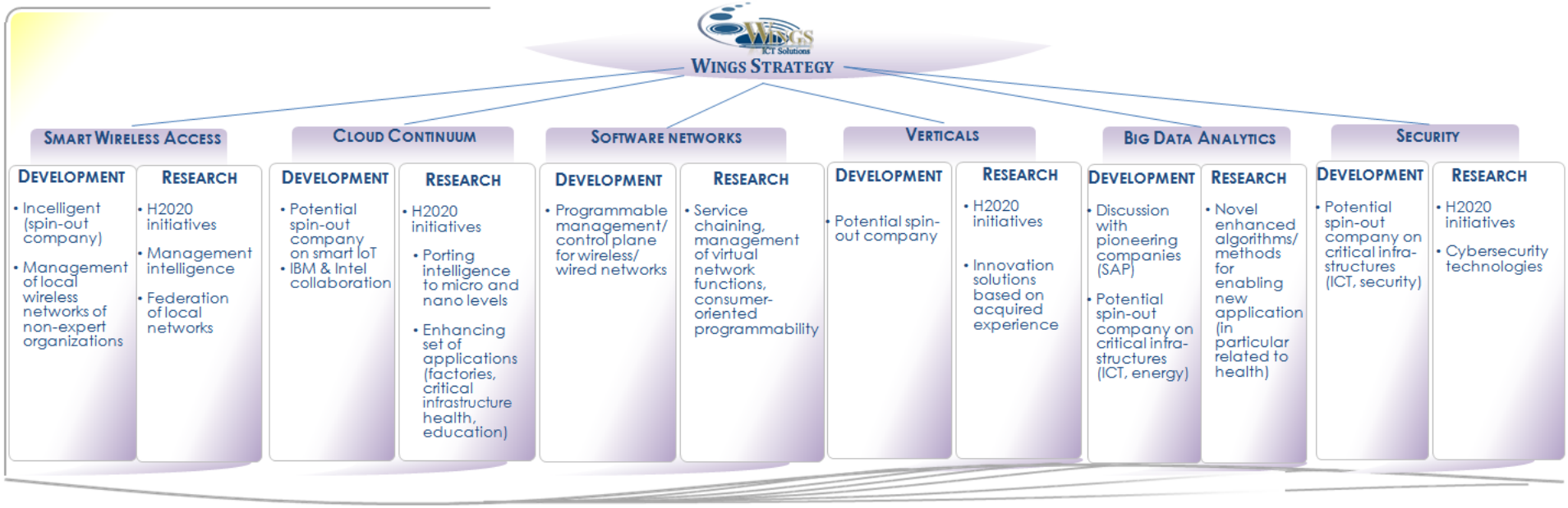


Main message

"technology enablers and inter-disciplinary research and development for an inclusive, cohesive, sustainable and prosperous society"



Description of the your research interest



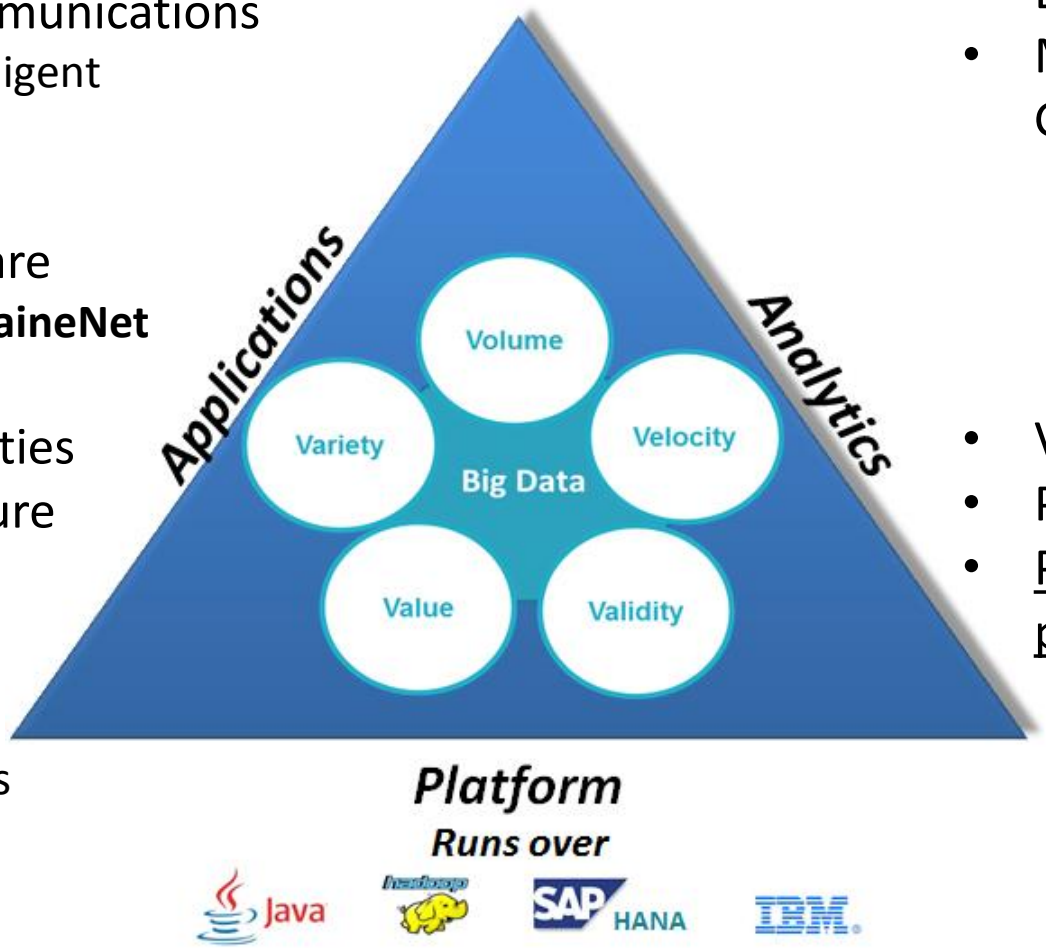
Potential applications

- Telecommunications networking
- Agriculture
- Energy
- Health
- Transportation
- Smart Cities
- Retail
- Tourism
- Digital Government

Background
Big Data Analytics - Application Areas

- Telecommunications
  - Incelligent
- Energy
- Water
- Healthcare
  - **MigraineNet**
- Finance
- Smart Cities
- Agriculture

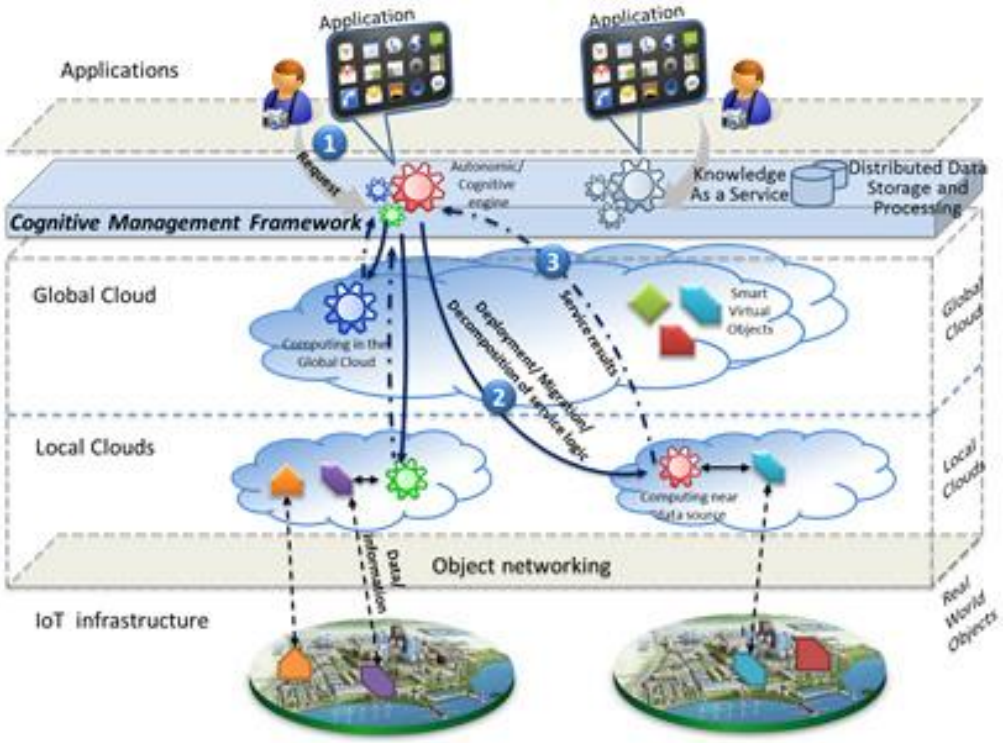
Collaboration with IBM and other vendors and SMEs



- Big Data Analysis
- Machine Learning/ Generate Knowledge
  - Supervised learning
  - Unsupervised learning
  - Reinforcement learning
  - Deep learning & other SOTA algorithms
- Visualise Knowledge
- Predictive mechanisms
- Publications and patents

Background
IoT/Cloud Systems

Intelligence for cloud-based Internet of Things (IoT) applications and services



Exploitation:

Forthcoming spinout of a company on intelligence, cloud-IoT and wearables

- **Cloud-based functionalities** for optimal service deployment and distributed management of smart objects;
- **Semantic data modelling** to enable data aggregation and smart object abstraction;
- **Mechanisms for knowledge generation**, visualization and sharing as a service;
- **Prototypes** and demonstrations development.

- **Projects:** MigraineNet, iKaaS, Proteus

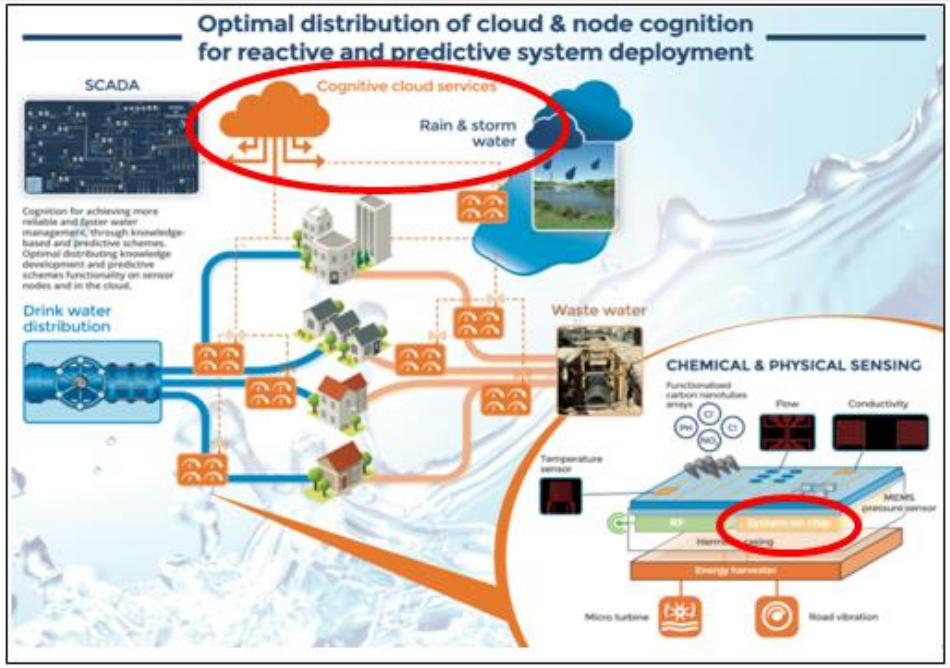
Background
Application Areas - iKaas

- Ubiquitous Smart Home and Smart City cloud-based IoT services
  - home automation,
  - remote health monitoring
  - smart mobility providing navigation instructions, considering user preferences and
  - health/well-being status
- Distributed data processing and storage
- Global and Local Cloud Service Catalogues for discovery of (simple/complex) servicesGlobal and Local Cloud Service Management functionality for autonomous, dynamic composition, deployment, migration and orchestration of services
- functionality for autonomous, dynamic composition, deployment, migration and orchestration of services
- Global and Local Cloud Data processing for big data analytics, learning, knowledge inference and reasoning to support autonomous behavior and self-adaptation of applications.
- Virtual Entities (software) that provide generic interfacing to Smart Home, Smart City and Body area (wearables) devices such as indoor temperature, pollen sensors, blood pressure, etc.
- Validation through experiments

Knowledge as a Service for Assisted Living in Smart City
https://www.youtube.com/watch?v=_QIoorrjAWM

- **Next steps**
  - Leverage on iKaaS experience
  - Combine intelligent mechanisms/functionalities for providing AAL/eHealth services with increased added-value for the patient
  - Test functionalities in Large Scale Pilots, i.e., stressed scalability issues

Background
Application Areas - PROTEUS



- **Embedded operational/node** management software for context awareness and reactive capabilities
- **Embedded and cloud-based advanced functions** for cognitive and predictive smart systems
- **Operational/node management software** for context awareness and reactive capabilities
  - Embedded to CMOS chip (System on Chip)
  - Detection of alert/alarm and self-adaptation of measurement and transmission profiles
- **Advanced functions** for cognitive and predictive smart systems
  - Predictive schemes functionality both embedded to node and deployed in the Water Management System
  - Data analytics for identification of patterns and correlation of sensing data for understanding the behavior of water network and supporting the sensor manufacturing process (calibration, cross-sensitivity)

WINGS and Proteus received the "**WssTP Water Innovation SME Award**" in the context of the **Water Innovation Europe 2016**, June 21-23, Brussels

Demonstration of Embedded and Cloud-based software for Smarter Water Monitoring Systems
https://www.youtube.com/watch?v=A8luC9t13eU

Background
Application Areas – Water R&D

ICTURKEY
ISTANBUL 2016

Motivation

Long-term management of water resources requires:
(i) widespread, low-cost monitoring means, differentiated requirements
(ii) adaptive capabilities (dynamic monitoring setup and process)

Member of:
WssTP

Innovation

Reactive capabilities to external/internal triggers

Predictive capabilities for anticipating a critical event or to compensate for monitoring failure

Cross-sensitivity detection and automatic **online calibration**

Inter-correlation of sensing data in water operator network

Re-configurability and **adaptability** for supporting highly differentiated water parameters and use cases

Drink

Rain

Waste

ICT-31-2017: Micro- and nanoelectronics technologies
Project IDEA: MiniatuRe Blind-spots monitoring and surveillance smart system with self-powering capabilities

Main goal: Intelligent, multifunctional and autonomous **smart sensing observation/surveillance system**, that will be able to support several, highly differentiated application goals

Objectives:

- **Objective #1:** To provide an affordable and easily deployable miniaturized smart integrated surveillance system based on micro-electronics and innovative MEMS sensors. The system will integrate state-of-the-art detection, tracking and fusion approaches and will interoperate with the existing border security systems, in order to increase their performance by adding a missing “eye” in areas difficult to be observed up to now.
- **Objective #2:** To provide a smart sensing node with energy autonomy, low dependency and build in intelligence (environmental related cognitive capabilities and smart alarm pre-processing). Energy autonomy, achieved via a set of hybrid energy harvesting solutions, would differentiate the said sensor apparatus from all previously deployed systems of similar functionality.
- **Objective #3:** To ensure compactness, inherent robustness and manufacturability. Manufacturability in terms of relative ease in massive production at minimum B.O.M. cost and required infrastructure expenditures. Due to the nature of the environment it is going to operate in, maximum reliability is required. Compact dimensions can ensure minimizing the detectability of the devices by intruders and protect the device from animal’s “curiosity”.

Use cases:

- **Use case 1 – Border/Coastline Surveillance.**
- **Use case 2 – Domestic Security and Tracking Migration.**
- **Use case 3 – Critical Infrastructure Protection.**
- **Use case 4 – Monitoring of high-value packages, baggage and confined spaces.**

Consortium - profile of known partners and required partners

No	Partner Name	Type	Country	Role in the Project
01	WINGS ICT Solutions	SME	**EL**	algorithmic development for smart sensors and IoT
02	Industry partner	IND		Micro sensors/micro controllers/low power MCUs
03	Security Studies Center	NPO		security issues/use case/trials
04	Energy harvesting	UNI		Energy harvesting issues
05	University/Research Center	UNI		advanced power aware wireless communications protocols
06	Research Center or SME	RD		advanced system in package 3D techniques (industrialization and manufacturability experience)

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