



eltic-Plus⁺

Smart Connected World



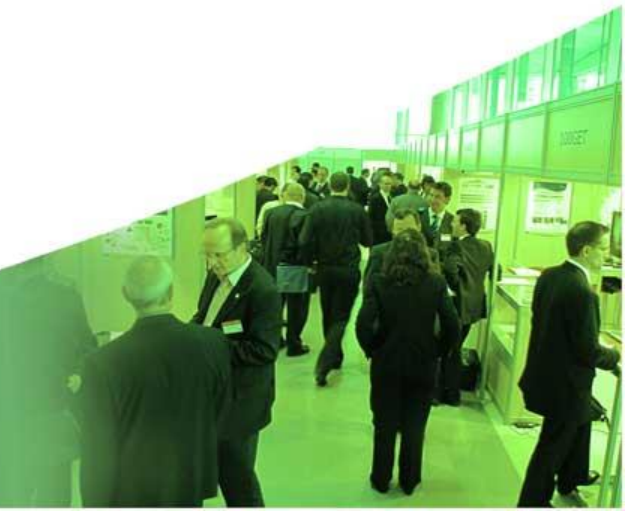
Celtic-Plus Event
28-29 April 2016, Stockholm

WINS@HI

Wearable IoT Network Solution for Work Safety in Hazardous Industrial Environments

Caner Aksoy, Technical Coordinator
caksoy@netas.com.tr

NETAS



- **Main Goal**

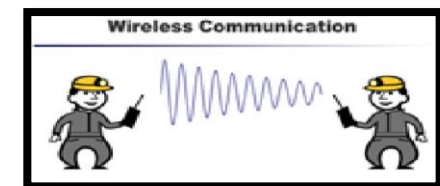
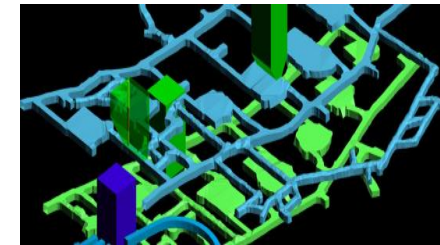
- Assessment of risks and preventing accidents
- Improving work safety of underground workers
- In case of occupational injuries and hazards
 - Tracking location of workers
 - Remote health monitoring
 - Guiding emergency and rescue units

- **Description**

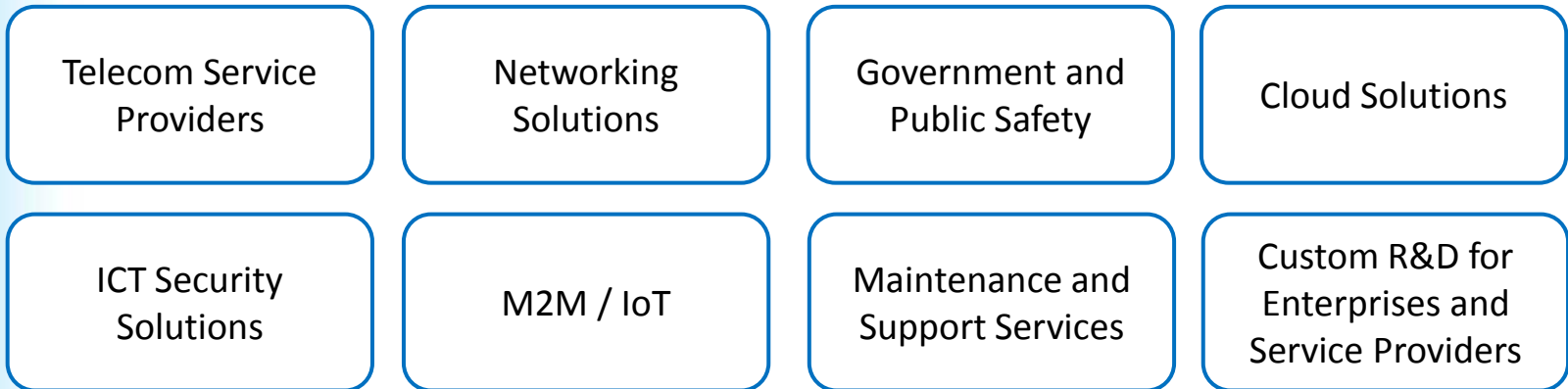
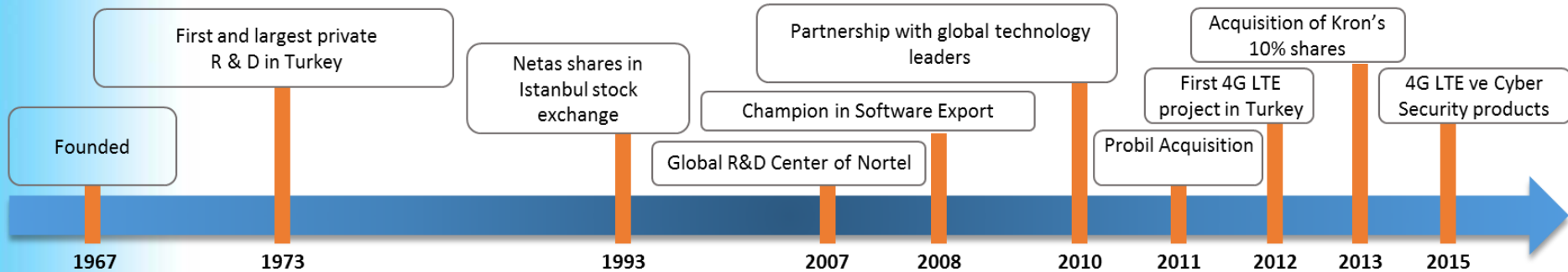
- Wearable sensor networks
- Wireless underground / indoor communication
- Data analytics
- Network anomaly detection and monitoring algorithms
- Disaster / emergency management

- **Status**

- Project is labeled and due to start-up



Organisation Profile



48 years of experience, global presence, field proven hardware \ software & application development, 1500+ businesses, Turkey #1 converged (carrier and enterprise) system-integrator also serving the region

Proposal Introduction

System Architecture



- Guide search/rescue units
- Mobile and web applications
- Network management/monitoring
- Anomaly detection algorithms
- Alarm management
- Location tracking
- Health monitoring
- Feature extraction
- Adaptive/machine learning
- Dynamic 3-D modeling
- Wearable sensors
- Energy efficient design
- Underground wireless comm.
- Scalable and robust

- **Pre-accident use cases:**
 - Health monitoring
 - Remote sensing of threats
 - e.g. Methane, dust explosions, flood
 - Early warning alarms to prevent disasters
 - Robust underground communication
 - Dynamic 3-D mapping
 - Location tracking

- **Post-accident use cases:**
 - Uninterrupted service after explosions or mine falls
 - Communication with miners
 - Precise location detection
 - Guiding search and rescue teams in case of emergency

WP1: Management

- Project coordination and administration
- Technical management

WP2: Requirements

- Business model
- System requirements and specifications
- Design and architecture
- Definition validation use cases
- Standardization issues

WP3: Wearable sensor networks

- Wearable sensor hardware design
- Sensor mesh network
- Sensing of mine environment
- Location tracking
- Sensing of health status of miners

WP4: Wireless underground communication

- Utilizing frequency bands
- Antenna design
- Communication protocols
- Interoperability with rescue unit systems

WP5: Data analytics and monitoring system

- IoT gateway design
- Platform development
- Data analytics, anomaly detection
- 3D mapping
- Software applications

WP 6: Testing and integration

- Testbed
- System integration and testing
- System performance testing

WP 7: Disseminations and exploitations

- Disseminations
 - Standardizations
 - Training and public awareness
 - Publications
- Exploitations
 - Business model
 - New markets

Current Partners

Turkey

All WPs

NETAŞ
International Leader



İmbat Mining



Nesta



Korgün Software



Istanbul Technical University



Boğaziçi University



Bahçeşehir University



Czech Republic

WP1, WP2, WP3, WP4, WP6, WP7

VUB Co

GiTy

Masaryk University (MUNI)

Technical University of Liberec (TUL)

Romania

All WPs

BEIA Consult International

Prospective Partners

Canada

NRC

CEMI

Newtrax

Vandrico, Priwen Systems

Accutron Instruments

6Harmonics

Sensorup

Portugal

Eurico Ferreira (PROEF group)

Centi

LIPOR

Partners

Are you interested in joining?



Please let us know about the WPs
that you would like to be involved!

- A.Belma Kaya
 - R&D Director
 - belmas@netas.com.tr
- Ersin Bayramoglu
 - Project Coordinator
 - ersin@netas.com.tr
- Caner Aksoy
 - Technical Coordinator
 - caksoy@netas.com.tr
- Necip Gozuacik
 - Technical Leader
 - gozuacik@netas.com.tr

