

# EUCISE2020 Industry Day

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## Contents of the Presentation

- UBITECH Facts and Technological Expertise
- UBITECH Experience in CISE
- UBITECH Technologies for EUCISE 2020

## The “Ubiquitous Technologies Company”

- **UBITECH** is an **innovative software house, systems integrator** and **technology provider**

- established in Athens (Greece) back in 2005
- concentrated initially in the **Greek** and **Balkan** market
- acquiring several **EC** grants for sophisticated **R&D** initiatives
- extending currently our operations with **international activities**
- through our subsidiaries and representation offices in **Limassol** (Cyprus), **Buenos Aires** (Argentina) and **Guayaquil** (Ecuador)



- Established to provide leading edge

- **ubiquitous secure technologies**
- **intelligent technical solutions**
- **consulting services**

to businesses, organizations and government

## Our Main Business Activities (1/2)

### ■ European and National Co-funded Research Programs

- Participation in research activities and projects, co-funded by the European Union's 6<sup>th</sup>, 7<sup>th</sup> and H2020 Research Framework Programs (including but not limited to the IST, ICT, HEALTH, IMI, AAL and Research for SMEs and SME Associations work-programmes)
- Participation in research programs by the General Secretariat for Research and Technology of the Ministry for Development of Greece

### ■ System Integration and Custom Software Development

- Design and development of Integrated IT Solutions and Tailor-made Software, utilizing custom software development frameworks and including training, help-desk and outsourcing activities
- Design, development, customization, deployment and support of enterprise-driven custom software applications and solutions, e-business (B2B) and e-commerce (B2C) solutions, e-government (G2G, G2B and G2C) and e-health solutions, as well as brand new software products and services.

## Our Main Business Activities (2/2)

### ■ e-Services and e-Processes

- Design and development of (transactional) portals exposing workflow-based e-services for customers, citizens and businesses
- Target Organizations: Public Administration and Central Government, Regional Administration and Local Government, and Private Sector

### ■ Technology Provision and IT Consulting

- Combining emerging technologies so as to help organizations to meet their business strategy goals and benefit from the power of technology innovation
- Definition of the IT Strategy, Infrastructure and Enterprise Architecture required for organizations to achieve their business objectives
- Increase of the R&D capacity of our business partners, staffing their project teams with our highly qualified and experienced research engineers, adding value and ensuring the robustness and success of the research and technological development process

# Our Personnel Expertise in Software Engineering



## Our personnel:

- pull of **25** people
- **R&D consultants** and **business analysts**
- **software engineers** and **system architects**
- **application developers** and **testers**

- System Architectures
  - **N-tier** Architecture
  - Service-Oriented Architecture (**SOA**)
- Component-based Development
  - **JEE** Framework
  - **.NET** Framework
- Development Environments
  - **Eclipse** and **Visual Studio .NET**
- Integration Technologies
  - **Web Services**
  - WSDL, UDDI, SOAP, BPEL4WS

## Current Status of UBITECH R&D Activities

- Participation in R&D and Large-scale IT Projects
  - UBITECH has completed successfully more than 50 R&D and Large-scale IT projects in the last 8 years
  - UBITECH is currently running or more than 20 co-funded research programmes and large-scale information technology projects
  - UBITECH ranks 1<sup>st</sup> among Greek enterprises with regard to EC funding acquired in the overall ICT-LEIT Workprogramme in 2014
  - UBITECH ranks 10<sup>th</sup> among Greek SMEs with regard to EC funding acquired from the ICT Workprogramme in the whole FP7 (2007-2013)
- Standardization Activities
  - UBITECH R&D Director participates as Member of Technical Committee of OASIS Cloud Application Management for Platforms ([CAMP](#)) led by Oracle and Red Hat for the standardization of a Cloud PaaS Management API
  - UBITECH has participated in the formulation of the ETSI Recommendation: Autonomic network engineering for the self-managing Future Internet (AFI)
  - UBITECH participates in the ADMS (Asset Description Metadata Schema) Working Group of ISA Unit of European Commission
- UBITECH Personnel has Authored / Co-Authored
  - More than 40 Research Papers

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## Maritime Surveillance Information System - Steps

- UBITECH has been a consultant for the European Commission on the CoopP project
  - for the technical representation and documentation of the Data Models
  - for the technical definition of the services enabling the exchange and sharing of information complying to these Data Models
- Dr. Panagiotis Gouvas (R&D Director) participated in the realization, documentation and delivery of:
  - the consolidation of the UML diagrams produced for each one of about 20 core entities (each one representing a main concept of the CISE) into a single UML class model of the CISE core vocabulary;
  - the specification of the OCL constraints in the consolidated UML model where necessary;
  - the specification of a XML schema and specification of an OWL ontology; and
  - the specification of services, defining the respective WEB Services (about 30 services) using WDSL

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## EUCISE Technological Areas to be Addressed(1/2)

- Support to end-users' operational tasks
  - ubi:analytics (TRL 6) implemented within LinDA FP7 project
- Identification and authentication
  - ubi:eXchange (TRL 9) deployed in two international use cases in Strasbourg (CIEC) and in Buenos Aires (RE.NA.PER)
- Information exchange
  - ubi:eXchange (TRL 9) for secure, signed and encrypted information and data exchange
  - SA-WSDL based Semantic Web Services (with functional and data semantics) for services publication, look up and discovery
- Collaboration services
  - BuddyPress (TRL 9) open source social networking, collaboration and experience sharing platform
  - Mobile compatible interfaces (HTML 5)
  - Apache OpenMeetings for video conferences

## EUCISE Technological Areas to be Addressed (2/2)

- **Interfacing Legacy Systems**
  - ubi:binder (TRL 9) for binding to any legacy systems' data sources as well as the ad-hoc extraction of custom data objects out of their data model
- **Multicast Pattern**
  - rabbitMQ (TRL 9) for Load Balancing and Online Validation
  - ActiveMQ (TRL 9) Asynchronous Communication and Diversification of Consumer Implementation
- **Service-Oriented Architectures**
  - W3C SA-WSDL recommendation on Semantic Web Services
  - RESTful services
  - ubi:paastunnel (TRL 6) for Platform-as-a-Service abstraction developed in PaaSport FP7 project
- **Data classification and access rights**
  - XACML-based context-aware data access policy model developed in PaaSword H2020 project

## UBITECH Technologies for EUCISE 2020

- Secure Document and Data Exchange
- Signing & Encryption
- Legacy Systems Binding
- Data Analytics
- Messaging Services

## Secure Document and Data Exchange

- **ubi:eXchange** facilitates the **secure interchange of digitally signed structured and unstructured documents and data among trusted partners**
  - e.g. individuals, enterprises, organizations, regions, countries
- **Basic features:**
  - definition of documents templates and data structures, facilitating the automated generation of web forms;
  - automated creation of PDF files following a specific document template;
  - fully automated creation, management, revision and transmission of structured and unstructured documents

## Secure Document and Data Exchange

- ubi:eXchange integrates a powerful Public Key Infrastructure (PKI) – EJBCA
- ubi:eXchange realizes several security mechanisms
  - digital signing on the created documents and data files;
  - asymmetric encryption of the digitally signed documents; and
  - users' single sign-on using digital certificates
- Due customers' needs, ubi:eXchange interoperates with different PKI Certification Authorities
- ubi:eXchange allows for smooth integration and synchronization with existing PKI structures

## Secure Document and Data Exchange

- **Case Studies:**
- International Commission on Civil Status (ICCS)
  - International intergovernmental organization that operates towards the European integration (15 Member States and 7 Observer States)
  - Cross-Border Secure Data and Document Exchange among ICCS Member States
- National Registry of Persons (RENAPER – Registro Nacional de las Personas)
  - The National Agency responsible for the registration and identification of all individuals who are domiciled in the Argentinian territory or jurisdiction of the Republic of Argentina
  - National Secure Data and Document Exchange among the 24 Provinces of the Republic of Argentina

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## Signing & Encryption

- **ubi:signer** enables the **sender of a document to authenticate himself/herself to the receiver by utilizing digital signatures and public key cryptography**
- **Basic features:**
  - **Digital Signing:**
    - the sender utilizes the signing functionality of ubi:signer so as to apply his/her own digital signature to the document;
    - the users of ubi:signer have to use a pair of personal public-private keys, stored in a hardware security module;
  - **Encryption:**
    - ubi:signer adopts an asymmetric encryption approach using the pair of public-private keys;
    - ubi:signer allows end-users to encrypt, store and exchange documents using the public key of the receiver

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## Legacy Systems Binding

- **ubi:binder** promotes the **service-oriented adaptation of native legacy systems, constituting a customizable mechanism for the dynamic generation of Web Services on top of the data sources of these systems**
- **Basic features:**
  - enables the **binding to any legacy systems' data sources** and the **ad-hoc definition of custom business objects** out of their data models;
  - facilitates the **semi-automated generation and grounding of Web Services realizing CRUD methods** (Create-Retrieve-Update-Delete) on the user-defined business objects, using reverse-Hibernate models
  - **ubi:binder** can be deployed as a Web-based toolset that can be used by any system developer and engineer

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## Data Analytics

- **ubi:analytics** enables **organizations to utilize and share analytic methods on linked data for the discovery and communication of meaningful new patterns that were unattainable or hidden in the previous isolated data structures**
- **Basic features:**
  - **ubi:analytics is based on an extensible and modular architecture that facilitates the integration of algorithms on a per request basis;**
  - **to support linked data analytics, an ontology is being designed, aiming at the representation of the interlinking among input and output datasets;**

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## Messaging Services

- **Load Balancing and Online Validation**  RabbitMQ™
  - rabbitMQ has been integrated at an electronic payment application for managing asynchronous messaging with e-customers in order to validate their identity and inform them during the payment phases;
  - as the number of concurrent consumers of the public service tend to be very high, the asynchronous messaging implementation (based on queues) contributed to the efficient load balancing of the overall system
- **Asynchronous Communication and Diversification of Consumer Implementation**  ActiveMQ
  - ActiveMQ has been integrated at an integrated platform to allow “consumers” subscribe themselves in the topics of their interest and proceed with various actions once the topic has been “updated”

**Thank you very much for your attention!**