

Research & Innovation 2017

Innovation is in our DNA

Come with us
to the future of technologies

A young boy with light brown hair, wearing a blue polo shirt, is shown from the chest up, smiling and looking upwards. He is holding a white paper airplane with both hands, extending his right arm towards the top right of the frame. The background is a bright, cloudy sky. A thin blue line starts from the right edge of the text area and extends diagonally across the sky.

Atos

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Research & Innovation

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Innovation is in our DNA

From R&D and Innovation to Technology Transfer and Business Development

Welcome to this new annual issue of our booklet, which presents Atos Research & Innovation (ARI) activities during 2017.

Our mission is to investigate emerging technologies and anticipate market demand with innovative solutions. However, logically, one of the main challenges faced by our group is to reduce the gap between research, innovation and the market. Due to the progress made in approaching different teams within Atos, as well as directly with potential customers, ARI is able to transform acquired knowledge and developed solutions into real business opportunities.

The 'Strategic Projects' section is the place to go for an overview of projects that have strong chances to become part of the offering to the market due to their business value and expected impact on society

ARI expertise and innovation focus is being recognized as a valuable source of business. A good example is the delivery of Innovation and Ideas Generation workshops based on a methodology developed within a R&D project. Having brought successful results to the company, ARI runs those workshops regularly in Atos and they are offered as an added value service to Atos customers.

Thanks to ARI, Atos is a full member of the Big Data Value Association [BDVA](#), the Alliance for Internet of Things Innovation [AIOTI](#) and the [5G Infrastructure Association](#). Atos Spain is a core partner of [EIT Health](#) and [EIT Digital](#). Atos is also a platinum member of the [FIWARE Foundation](#) with the support of ARI and due to our active participation in the whole FIWARE initiative. ARI experts sit on the governing boards of all those associations.

In 2017, Atos Spain became member of the European Factories of the Future Association [EFFRA](#). This Public Private Partnership (PPP) coordinates the Factories of the Future (FoF) topics in H2020. Our expectation with this membership is to position Atos Spain as a reference in the R&D Manufacturing Domain. Additionally, Atos has been particularly active in two working groups (Digital Platforms and Digital Innovation Hubs) instruments to the [Strategy for Digitizing European Industry \(DEI\)](#).



Finally, the number and diversity of projects described in this report show the intensive activity of our group. The latest [EU H2020 statistics](#) continue to rank Atos Spain as the first Digital Services company at European level with most participation in projects. This excellent position in the EU Research and Innovation arena increases the visibility, not only of ARI and Atos Spain, but also of Atos as a global company.

Don't hesitate to send us your feedback at es-atosresearch@atos.net, we are happy to take it into consideration!

Objectives and organization

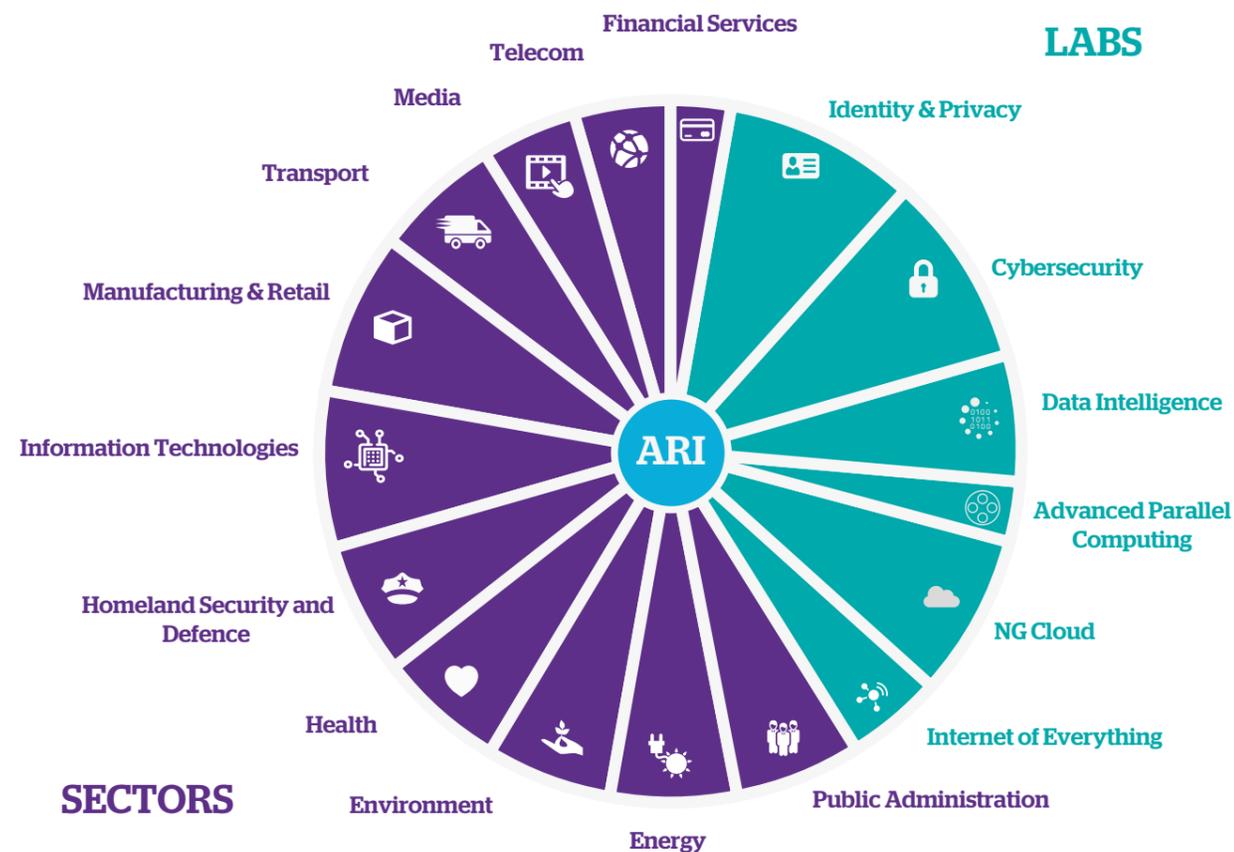
ARI structure is designed to favor collaboration with Atos sales teams

The Research & Innovation group is the R&D hub for new technologies and a key reference for the whole Atos group. Thanks to our large expertise in research, development and innovation projects, we are able to bring new solutions and innovative elements to customers' business. The group focuses on projects development, combining economic exploitation of investigations' results and the most up-to-date technological achievements with high awareness of human and social factors. The main objectives of the Research & Innovation group are to:

- Be a source of innovative solutions to be used by Atos sales force and technical staff
- Become an entry gate to European institutions for the different units and customers of Atos, thanks to the large background of European Commission projects (since 1987)
- Support Atos business units in other countries, as well as their customers, thanks to the network of public and private partners across Europe, which in turn, are current or potential customers of the company

- Participate in research, development and innovation (RDI) projects that enrich Atos offer portfolio, market view or position with respect to emerging technologies

Our team is distributed in various locations: Madrid, Barcelona, Bilbao, Sevilla, Valladolid, Santa Cruz de Tenerife in Spain, Brussels in Belgium, Istanbul and Ankara in Turkey. The group is structured in a way to facilitate the relationships with the different Markets and Service Lines of the company. Thus, we are organized in ten Sectors within Atos established markets and six Technological Labs. The structure fosters the alignment of emerging technology research and development with the market / customer needs. Our ultimate goal is to be at the upfront of R&D in Digital Technologies, with a deep knowledge of business and societal challenges.



Capabilities

The vision of the Research & Innovation group of Atos is mainly focused on applying the latest research outcomes to real world situations where Atos clients need solutions that go beyond what current products provide.

You will find in our group a source of innovative ideas and expertise in emerging technologies.

In this sense, we are the R&D hub for the whole Atos Group. Thanks to our large expertise in research, development and innovation projects, we are able to bring new solutions and innovative elements to customers' business.

Our focus on the combination of advanced technological developments and commercial exploitation of project outcomes leads to innovative but realistic solutions. Our capacity of coordinating international partnerships and our extended network of technology centers, universities and user organizations makes us a reliable business partner.

Since 1987, we have been deeply involved in research, development and innovation (RDI) projects. We have become an extremely well-known player in the European research arena, with references in various Directorates-General of the European Commission.

Furthermore, Atos, as an ICT global player, is active in long-term EU working groups and therefore has a say in the definition of future funding programs. For almost 30 years, we have acquired valuable expertise in innovation management.

Based on the day-to-day activity in research and innovation projects, our group has developed efficient working processes, templates, knowledge base, and collaborative tools. From strategy to project management, from the generation of ideas to the identification of funding opportunities and selection of the right partners, from opportunities to results, the group covers all activities and is able to provide reliable support services to our customers.

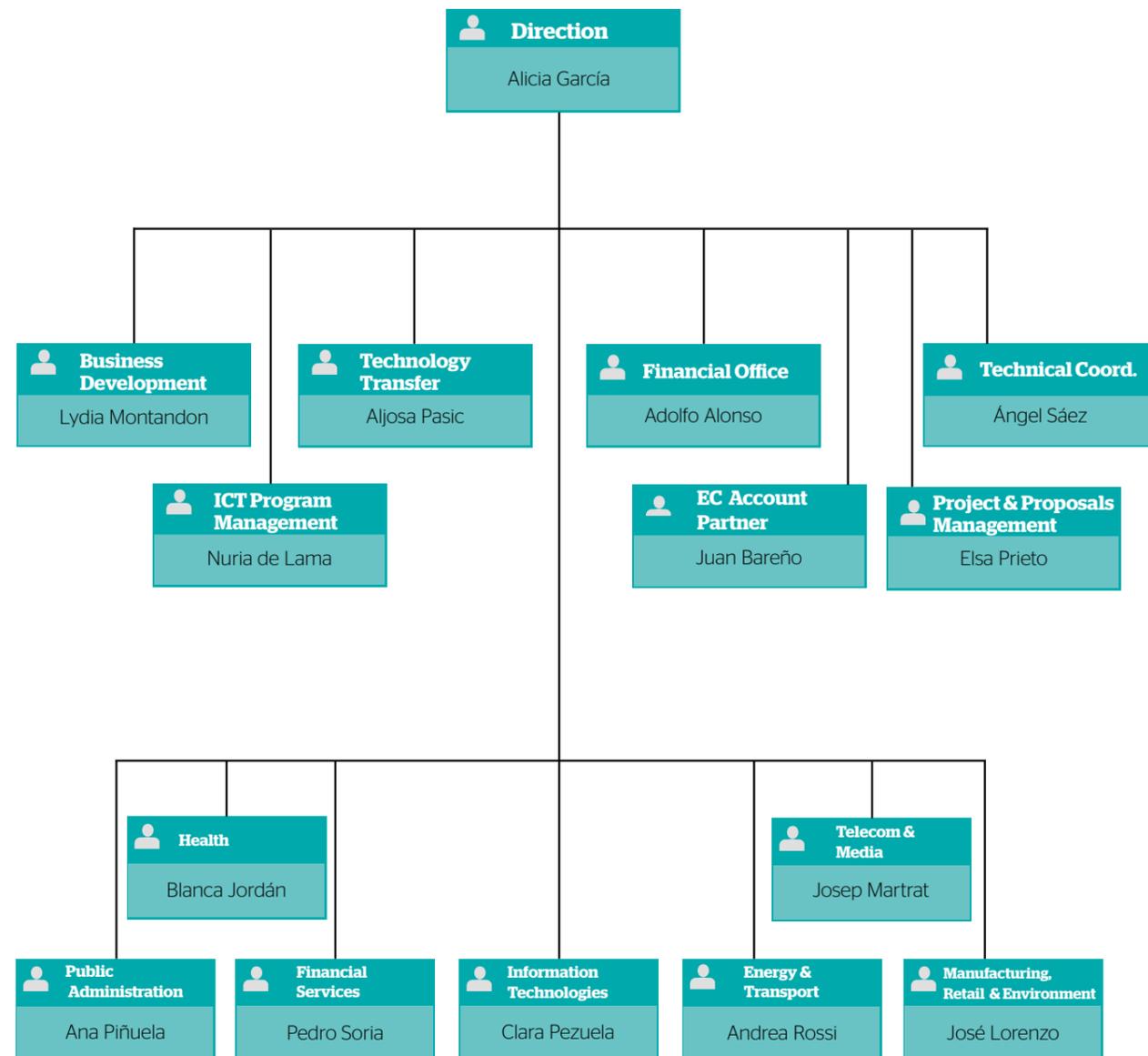
All these capacities build on the diversity and preparedness of our people. Our experts cover a wide range of disciplines, from emerging technological areas to social sciences and economics.

Teams are multi-disciplinary and multicultural, and are thus able to dialogue with customers and understand their needs. Atos customers can benefit from our group's RDI related services, such as: advanced technology watch; innovations ideas channeling; evaluation and management; alignment of the organization's RDI strategy with public funding sources programs; proposal drafting and delivery; proposals negotiation; and proper project management office.



Structure

The following diagram shows the structure of ARI management staff. A head of market coordinates all RDI activities related to Atos main markets and guarantees fluid communication with commercial staff and customers.



Sectors

Financial services

Adapting to the challenges of Future Internet and new ICTs

Description

The world of Financial Services applications is changing due to the increased openness of IT environments, mergers and acquisitions, and above all, significant challenges brought on by customer and market dynamics. The FS sector searches for the right answer to these changes and challenges by doing research into the Future of Financial Services.

For more than ten years, R&D projects have been developed in order to ensure secure transactions, provide higher availability, confidentiality and integrity of financial services, and in recent times new trends like Big Data, IoT, and Competitive Intelligence are also paving new research in information management for financial services.

Goals

The goal of this sector is to ensure transition and explore the application of our research & innovation solutions in the financial services industry. These solutions are rooted in our activities in information security, semantic technology for the real time processing of data (e.g. news and transactions, among others), and smart city technologies.

The Research & Innovation Financial Services sector feeds requirements, business concerns and challenges of the Financial Services industry to motivate research activities in multiple areas of work, while also opening opportunities for exploitation of research outcomes in banking, insurance, and financial services.

Main activities

- Helping Financial Services customers identifying R&D challenges and driving them into requirements for new R&D projects.
- Promotion of project results and developed assets to Atos customers in the Financial Services sector.
- Development of ICT systems and platforms that support innovation in Financial Services, both in their operation and in their business models.
- Elaboration of plans for the exploitation of research project results in the Financial Services market.



Pedro soria
Head of Market



Elsa Prieto
Head of Sector

Challenges

Customers in the Financial Services market are faced with challenges of both technical and business nature that call for ICT-based solutions.

- Adapting business models to an economy more and more driven by management of information.
- Taking stock of the vast amounts of information owned by banks, to be exploited for the business and operational benefit of the organization.
- Security concerns over the use of emerging technology business models (e.g. cloud computing).
- Exploiting the potential of mobile and social-networking technologies in banking, and in insurance.
- Management of compliance in a highly regulated business environment.

Current Research Topics and Findings

- Analysis of large amounts of information to derive intelligence for enhanced competitiveness and improved operational efficiency.
- Data trends and sentiment analysis.
- Security in cloud computing, allowing the adoption of models such as SaaS, PaaS and IaaS (identity as a service) by the Financial Services industry, largely reliant on legacy technologies.
- Privacy-enhancing technologies and advanced cryptography approaches as building blocks for privacy-enhancing identity management and data management in trusted and untrusted domains.

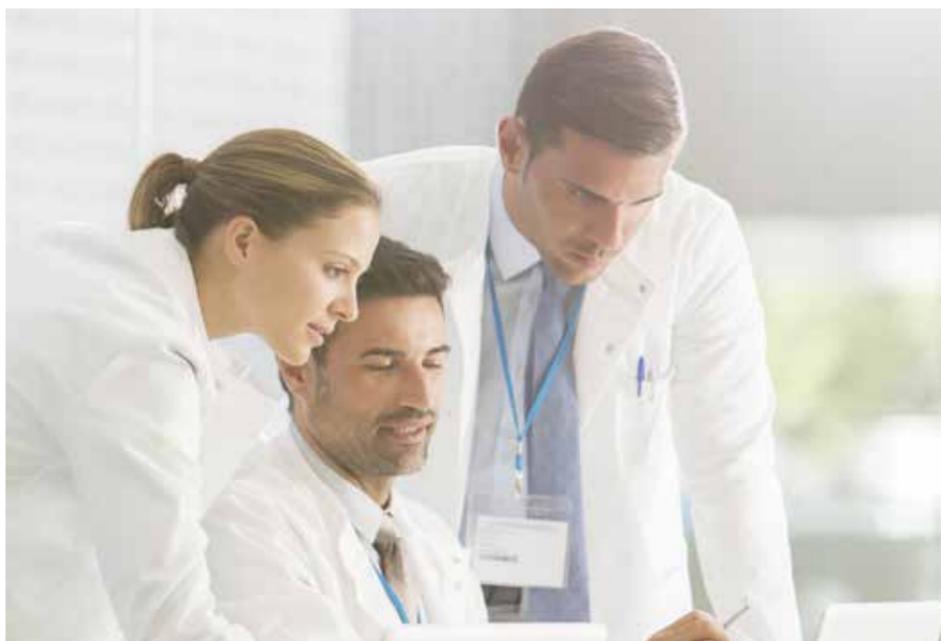
Title	Project Title	Funding	Description	Web
CYSPA	European Cyber Security Protection Alliance	FP7	Addressing trustworthy ICT through a European strategy to protect cyberspace, with target audiences ranging from research communities and industry to public authorities and infrastructure operators.	cyspaeu
WISER	Wide-Impact Cyber Security Risk Framework	H2020	Puts cyber-risk management at the heart of good business practice, benefiting critical infrastructure, process owners, and ICT-intensive SMEs. Provides a cyber-risk management framework able to assess, monitor and mitigate risks in real-time, in multiple industries.	cyberwiser.eu
WITDOM	Empowering privacy and security in non-trusted environments	H2020	Automatic and efficient privacy provisioning solutions, keeping data confidential in the un-trusted environment, while the data owner can operate with and make use of the data in the encrypted domain.	witdom.eu

Health

Responding to the challenges of ageing populations on the increase of chronic diseases and shortage of healthcare workers

Description

The Health sector counts with more than 15 years of experience in developing research and innovation projects related to life and care sciences, in topics like medical images treatment and analysis, information management, EHR interoperability, artificial intelligence for decision support systems creation, remote monitoring and patient assistance. In the last years, we are focusing on bioinformatics, nanotechnology, algorithms and big data development for omics data analysis



Goals

- Research on the application of ICT to the health domain for the improvement of services for professionals and patients. Precision Medicine.
- Direct application of knowledge and research results to the development of innovative solutions and services.
- Technology transfer from research projects to Atos customers in the field.

Main activities

- Connected Health and care.
- Big data for Omics Technologies and data analysis.
- Big data for services within the healthcare domain.
- Data-driven health transformation.

Challenges

- The inclusion of relevant standards for medical devices communication and electronic health records. This relates to the integration of widely used health dictionaries such as SNOMED and LOINC with the most accepted standards for medical devices, such as ISO/IEEE 11073 and openEHR, ISO/EN 13606, HL7 and FHIR for data interoperability.
- Omics Technologies: Analysis and integration of omics data, including the complete set of process and biochemical reactions related to biological processes (metabolomics), allow to reach a surprising understanding of the complex cellular system. The ever-increasing data generated by these technologies are having a great impact in the biomedical research framework, as well as in the clinical practice.



Blanca Jordan
Head of Sector



Manuel Pérez
Deputy Head of Sector

Current Research Topics and Findings

- Services to exchange, integrate and analyse huge amounts of data collected from different sources into a global information infrastructure or "infostructure" (addressing semantic and standard interoperability, cloud and grid computing, network agility).
- Algorithms to model data and simulate physiological behavior, and to extract information from this model/simulation.
- Sensors networks to gather different physiological and environmental/localisation data (Internet of Things).
- Ubiquitous and mobility-proof network to keep actors connected anytime anywhere (m-health).
- Connected Health and care.
- Information provision through Semantic Web Services.
- Patient empowerment, patient centered and connected patient.
- Data-driven health transformation.

Title	Project Title	Funding	Description	Web
ACANTO	A cyberphysical social network using robot friends	H2020	Using robots to increase the number of older adults who engage in a regular and sustained physical activity.	ict-acanto.eu
AHEAD	Augmented hearing experience and assistance for daily life	AAL	Integration and combination of advanced sensing devices and ICT based modules, using eyeglasses and hearing aid as a support for assisting elderly people.	ahead-project.eu
ALFRED	Interactive assistant for independent living and active	FP7	Development of a mobile personalized assistant for elderly people, enabling them to remain independent, facilitating coordination with their caregivers and promoting social inclusion.	alfred.eu
CrowdHealth	Collective wisdom driving public health policies	H2020	Integration of high volumes of health-related heterogeneous data from multiple sources with the aim of supporting policy making decisions.	crowdhealth.eu
DAPHNE	Data-as-a-Service platform for healthy lifestyle and preventive medicine	FP7	Development of a platform to deliver personalized guidance services for lifestyle management to the citizen/patient.	daphne-fp7.eu
FACET	Frailty care and well function	EITH	Development of a tool to integrate and query human phenotypic data in order to early detect frailty. The goal is to permit intervention on it and the associated diseases to prevent or delay the onset of disability.	
HAIVISIO	Enhanced visibility and awareness in eHealth, active ageing and independent living projects	FP7	Fostering a common strategy for joint dissemination activities and exploitation plans for eHealth, Active Ageing and Independent Living projects.	haivisio.eu
HarmonicSS	Harmonization and integrative analysis of cohorts on primary Sjögren's Syndrome	H2020	Development of a platform with open standards and tools, designed to enable secure storage, governance, analytics and controlled sharing of information of primary Sjogren Syndrome.	harmonicss.eu
HeartMan	Personal decision support system for heart failure management	H2020	Development of a personal health system for congestive heart failure (CHF) that features a Decision Support System based on predictive computer models.	heartman-project.eu
PAPHOS	Platform for advanced prescriptive health operational systema	EITH	Implementation of a secure platform that allows different actors involved in the healthcare chain to move from the reporting to prediction and prescription focusing on multimorbidity treatment combining medical data records with patient monitoring.	
WITH-ME	European platform to promote healthy lifestyle and improve care through a personal persuasive assistant	ARTEMIS	Provision of a health prevention platform and personalized services to improve patients' general health conditions and prevent occurrence from a range of diseases.	with-me-project.eu

Information Technologies

Building the future Internet to address the major challenges of society and enterprises

Description

The Information Technologies (IT) sector addresses the IT market, including software companies, solutions integrators and software consultants.

This sector is strongly »»»ed to the "Next Generation Cloud" Lab and "Software Engineering" formal research line. While the lab and research line concentrate on research projects and most of the technological developments, the sector is more focused on innovation and technology transfer projects. It also provides the required support for the management of the projects and the exploitation of research results.

Goals

The sector has a twofold objective: on one hand, fostering the adoption and transfer of emerging technologies surrounding Cloud and Edge Computing, Software and Service Engineering, Digital Platforms and recently Robotics to Atos business units, to align the research activity with customers' needs, providing added value solutions to be included in the company's portfolio; and on the other hand, promoting the use of produced R&D assets in the IT sector-related market.

Main activities

- Research and development activities dealing with IT challenges, through the active participation in market-driven R&D projects.
- Collaboration with related Atos Business Units to collect requirements and provide them results and components from R&D projects.
- Transfer the obtained research results to Atos, through Business Development, Scientific Community, Centers of Excellence and Market Leaders.
- Developing support actions to create roadmaps and research agendas for challenges in the domain of ICT, with focus on cloud, robotics and software engineering.



Clara M Pezuela
Head of Market

Challenges

- Implementation of Computing Continuum concept by research in Cloud Integration, Multi-cloud, Edge Computing and Swarm Computing
- Efficient management of IoT, Edge and Cloud, providing a significant step toward massively distributed computing models
- Software Engineering techniques for software modelling and development, with focus on self-adaptive software in complex systems
- Digital Platforms for the Future Internet, by using FIWARE as baseline technology, to different verticals in Smart Cities, Smart Industry, Health, and others
- Use of Artificial Intelligence (by adding an adaptive control layer) to tame the complexity arising from the interplay between IoT, connected homes and cars, autonomous robots and cloud and edge computing; and allow organisations managing operations through real-time data-driven decisions and natural human-computer interaction
- Deployment of Open Source models, development and processes

Current Research Topics and Findings

The sector's research activities are focused on being an active part of the future roadmaps definition in different domains (Future Internet, Green IT, Services, Cloud, Software Engineering, AI, Robotics, Big Data, IoT etc) materialized through the participation in several initiatives and

platforms such as PLANETIC, NESSI, BDVA, EIT Digital, among others. While the lab and research lines are more focused on research in the short-mid term, the sector participates in the definition of a longer term view, driving the principal market needs towards the lab.

Title	Project Title	Funding	Description	Web
ARTIST	Advanced software-based service provisioning and migration of legacy software	FP7	Set of methods, tools and techniques that facilitate the transformation and modernization of legacy software assets and businesses.	artist-project.eu
Elastest	An elastic platform to ease end to end testing	H2020	Tool for helping developers to test and validate complex distributed systems, based on three principles: test orchestration, instrumentation and monitoring, and test recommendation.	elastest.eu
FI-NEXT (FIWARE)	Bringing FIWARE to the next step	H2020	Development of applications and services based on FIWARE platform which has demonstrated its potential of becoming a service platform of choice.	fiware.org
MCloudDaaS	Multi-Cloud Data Analytics as a Service	EIT-DIGITAL	Extending the benefits of Big Data Analytics to Multi-Cloud environments offering innovative functionalities with regards to security, scalability and fault-tolerance.	
MegaMart	Mega modelling at runtime	ECSEL	Scalable model-based framework for continuous development and runtime validation of complex systems.	megamart2-ecsel.eu
PLANETIC	Plataforma tecnológica para la adopción y difusión de las tecnologías de información, electrónicas y de comunicación	Spanish Ministry of Economy and Competitiveness	Spanish technology platform for the adoption and promotion of electronic, communication and information technologies.	planetics.es
SLALOM	Legal & open model terms for cloud SLA and contracts	H2020	Provision of two SLA reference models for cloud computing: one for cloud SLA legal contracts, and the other for technical SLA specifications.	slalom-project.eu
Smart-FI (CityGO)	Exploiting aggregated open data from Smart Cities for the future internet society	ERA-NET Smart Cities	Platform to deploy services exploiting aggregated open data from smart cities, providing methodologies to homogenize heterogeneous open data and data services, analytics to predict patterns and make recommendations.	smart-fi.eu
STAMP	Software testing amplification	H2020	Advanced research in automatic test generation, by pushing automation in DevOps one step further, and reusing existing assets to generate more test cases and configurations when the application is updated. It brings amplification services at unit level, configuration level and production stage.	www.stamp-project.eu
SUPERSEDE	Supporting evolution and adaptation of personalized software by exploiting contextual data and end-user feedback	H2020	Feedback-driven approach for software life cycle management, with the ultimate purpose of improving users' quality of experience.	supersede.eu
Synchronicity	Delivering an IoT enabled digital single market for Europe and beyond	H2020	Harmonized ecosystem for IoT-enabled smart city solutions where IoT device manufacturers, system integrators and solution providers can innovate and openly compete.	synchronicity-iot.eu

Energy

The new energy scenario: welcome to the century of digitalized energy systems

Description

The way we are generating, distributing, and using resources (electricity, water, oil & gas) in Europe has changed dramatically in the new century. Specifically in the energy sector due to new opportunities to generate and store renewable energy and the declining of fossil energy sources together with the introduction of smart energy grids and European deregulation. Embracing the 3 Energy Ds (Decentralization, decarbonisation and digitalisation) requires the participation of new players. Their role as incumbents is changing fast and supports traditional players to evolve towards a more sustainable energy ecosystem. An ICT-driven market place is already a reality for all energy actors and stakeholders that should be guided towards a process of digital transformation. ICT energy systems and applications are at the very core of these changes, being the key enablers for smart energy innovation



Goals

The main goal is to deliver research & innovation initiatives across the entire energy value chain with focus area covering the major challenges faced by its main players and stakeholders, spanning across every segment of the energy market (electric, water, oil & gas), thus driving the digital transformation of the European energy industry.

Main activities

Activities are driven by the application, in the energy domain, of advanced ICT smart systems and technologies:

- Electric distribution network: advanced smart grid automation together with control and management of distribution networks. Paving the way so as to anticipate the increased use of distributed energy generation and storage. Adaption to Demand-Response requirements.
- Microgrids and Nanogrids: the introduction of distributed energy resources supports the establishment of regional microgrids or local nanogrids, aggregating and largely autonomously controlling their own supply and demand side resources.
- Electric Vehicles: the large scale penetration of electrical and hybrid vehicles requires interaction between the energy infrastructure, the transport infrastructure, the vehicle information systems and the communication network infrastructure. This means collecting, processing and delivering all the needed information.
- Efficient Water Management: oriented to urban and rural areas through the implantation of smart ICT application and services for water utilities and consumers



Andrea Rossi
Head of Sector

Challenges

The European energy & utilities market industry is facing major challenges towards the Energy and Climate targets for 2020 and beyond to reduce greenhouse gas emissions, increase the share of renewable energies and improve energy efficiency.

- Deregulation, the green agenda, and ICT technology improvements have changed the utilities rulebook upside down. Smart metering and smart grids are key to research, innovation and as well commercial deployments, playing also a relevant role as for the exploitation of the data sets generated in the process.
- The increasing proportion of electricity from renewable sources means that the ICT energy systems supporting the grid will have to be distributed and adapted to a highly volatile supply (e.g. from wind and solar generators). From the consumption perspective, real-time adaption of fares to the cost of energy consumed will create and drive future consumption patterns. At the same time, private and commercial consumers are being encouraged to efficiently use their resources (electricity and water) and to participate in the generation, distribution and storage of electricity.

Current Research Topics and Findings

Energy sector main findings come hand by hand with ongoing projects, as listed below, aiming at bringing together relevant aspects of future ICT smart energy systems:

- Integration of cutting-edge technologies, solutions and mechanisms in a scalable Cross-Functional Platform connecting energy networks with diverse stakeholders, facilitating optimal and dynamic operation of the Distribution Grid (inteGRIDy).
- Sustainable integration of electric vehicles (EL-Vs) in cities supported by ICT tools for managing the availability of vehicles, charging spots and parking places, and brokering energy to assure proper provision and availability of energy to meet supply needs. (ELVITEN).
- Interoperability network that connects the capacities of the neighbourhood and wide regional Renewable Energy Sources plus Electrical Energy Storages (EES) ecosystems into a collaboration framework that mitigates the requirement of the overall EES capacities thanks to the shared capacities among the participating actors (SHAR-Q).
- Deployment of a distributed ICT infrastructure, combining in-vehicle and cloud based approach collecting and processing data generated by the e-vehicle, and distributing commands for optimizing energy consumption of the different climate systems (Heating, Ventilation and Air Conditioning) for reaching a global energy savings of 50% (JOSPEL).

Title	Project Title	Funding	Description	Web
Contractual Research	Contractual Research for Energy Services in Slovakia	ERDF Slovakia	Smart Grid, Security and Big Data contributions to the International Centre of Excellence for Research of Intelligent and Secure Information and Communications Technologies and Systems in Slovakia.	
CPS4 Small Communities	Cyber-Physical Systems for Small Communities, empowering small communities to self-manage their utility services.	EIT-DIGITAL	Development of an Information and Communication Control Centre that enables small communities to self-manage their utility services by metering resources and monitoring parameters.	
ELVITEN	Electrified L-Category vehicles integrated into transport and electricity networks	H2020	eRoaming platform integrating ICT tools such as a Brokering and Booking service for Electrified L-category Vehicles (EL-Vs) and charge points, an EL-V fleet monitoring tool and Eco-Drive app, a Serious Game and an Incentive Management Smart Car.	elviten-project.eu
inteGRIDy	Integrated Smart GRID Cross-Functional Solutions for Optimized Synergetic Energy Distribution, Utilization Storage Technologies	H2020	Integration of cutting-edge technologies and solutions in a scalable Cross-Functional Platform connecting energy networks with diverse stakeholders, facilitating optimal and dynamic operation of the Distribution Grid.	integridy.eu
JOSPEL	Low energy passenger comfort systems based on the Joule and Peltier effects	H2020	Deployment of distributed ICT infrastructure in electric vehicles for enabling the application of innovative eco-driving strategies combined with efficient climate system.	jospel-project.eu
SAGA	Security & Privacy-as-a-service toolbox	EIT Innoenergy	Set of software tools & services continuously improving the security and privacy issues in the smart meter device market.	kic-innoenergy.com
SHAR-Q	Storage capacity sharing over virtual neighbourhoods of energy ecosystems	H2020	Optimization of the storage capacities deployed in the grid with the help of a peer-to-peer interoperability network that connects neighbourhooding RES+Storage ecosystems into a collaboration framework.	sharqproject.eu

Environment

Emerging geospatial technologies that support the development of distributed geo-spatial processes

Description

The Environment sector covers research and innovation for environment, and focuses its activity on the design and implementation of information architectures, oriented towards the seamless geospatial data distribution and execution of distributed geospatial processes, to improve Natural Risk Management.

Since 1999, the team has developed a large number of consultancy and research projects dealing with the use of the current geographical information standards and »»»ed in many cases with the European Policy Initiatives in this field (eg. INSPIRE).

Goals

Our main goal is to promote the adoption of emerging geospatial technologies that support the development of distributed geo-spatial processes. Therefore, the Environment sector is strongly »»»ed to the [Geospatial Information Research Line](#), where an important part of the technological activities are developed.



Main activities

- Research and development activities dealing with environmental challenges. This is mainly done through the active participation in market-driven R&D projects with geospatial technologies.
- Integration of in-situ & EO observations from environmental sensors.
- Expertise on OGC standards (WMS, WFS, WPS, WCS, SWE...).
- Implementation of geographical independent decision support and alerting systems for the prevention of disasters.
- Elaboration of business plans for the exploitation of research project results, oriented to the environment sector.

Challenges

- Earth Observation and Security. Extend the activity to Earth Observation and Security through the provision of inputs to the Copernicus and GEOSS initiatives.
- Multiple Risk Management. Extend the achievements reached in the FP6 project ORCHESTRA to multiple risk and emergency domains like early warning and tsunamis in FP7 project DEWS, biodiversity, cultural heritage, agriculture and many other domains.
- Observation Web. The research challenge to realize the Observation Web and the associated environmental enablers for the Future Internet leveraged by the work done in the Environmental Usage Area within the Future Internet PPP program of the European Commission.
- INSPIRE adoption. To be a reference partner for the Public Administration in the developments needed to adopt the INSPIRE directive.



José Lorenzo
Head of Sector

Current Research Topics and Findings

- Research use of Earth Observation Data for wildlife monitoring
- Creation of value from Copernicus data through the provisioning of modelling and analytics tools
- Climate change adaptation measure planning and decision support
- Secondary raw materials inventory
- Open Data and Big Data building on geographic information
- Driving innovation in crisis management

Title	Project Title	Funding	Description	Web
BONVOYAGE	Intermodal mobility solutions, interfaces and applications for people and goods	H2020, MG	Design, development and testing of a platform optimizing multimodal door-to-door transport of passengers and goods, supported by an innovative communication network.	bonvoyage2020.eu
CLARITY	Integrated climate adaptation service tools for improving resilience measure efficiency	H2020, CLIMATE	Exploiting/demonstrating the added value of climate services: climate services for climate-proofing of vulnerable urban and transport infrastructure.	clarity-h2020.eu myclimateservice.eu
DataBio	Data-Driven Bioeconomy	H2020, BIG DATA PPP	Big Data PPP Large Scale Pilot focusing in production of best possible raw materials from agriculture, forestry and fishery/aquaculture.	www.databio.eu
EO4wildlife	Platform for wildlife monitoring integrating Copernicus and ARGOS data	H2020, SPACE	Service platform and Toolbox for European Sentinel Copernicus Earth Observation data use for biologists, ecologists, scientists and ornithologists.	eo4wildlife.eu
EUXDAT	European e-Infrastructure for extreme data analytics in sustainable development	H2020, EINFRA	Enabling users to fully benefit from underlying High Processing capacities to explore new methods, build new innovative services and to perform predictions and simulations with extremely large and heterogeneous datasets.	euxdat.eu
FOODIE	Farm-oriented open data in Europe	CIP	Open and interoperable agricultural specialized platform hub on the cloud for the management of spatial and non-spatial data relevant for farming production.	foodie-project.eu
SMART GROUND	Smart data collection and integration platform to enhance availability and accessibility of data and information in the EU territory on secondary raw materials	H2020, WASTE	Fostering of resource recovery in landfills by improving the availability and accessibility of data and information on Secondary Raw Materials (SRM) in the EU.	smart-ground.eu

Homeland Security & Defence

Promoting innovative solutions and emerging technologies for the protection of citizens, goods and infrastructures

Description

The sector of Homeland Security & Defense (HSD) coordinates the research and the commercial exploitation of assets produced by the group targeted to industry and public institutions in the defense and security arena, and especially to the homeland security field. Ministry of Interior, the National and Regional Police Forces and also all types of organizations that address or deal with crisis management, citizen safety, critical infrastructures, crime fighting, law enforcement and border intelligence.



Goals

The main goal is to encourage the adoption of emerging technologies in the Homeland Security & Defense sector, as well as identify business opportunities for Atos when these involve issues such as crisis management, emergency services, protection of citizens, goods and infrastructures, border surveillance and management or ICT support for law enforcement.

Main activities

- Promotion of project results and developed assets to Atos customers in Homeland Security & Defense.
- Identification and pursuing new business opportunities in HSD in line with Atos innovative key digital services.
- Management of market-driven R&D projects, elaboration of plans for the exploitation of research project results oriented to security and civil protection.



Pedro Soria
Head of Market



Jaime Martín
Deputy Head of Sector

Challenges

- «»» strategy and technology: the HSD sector is guided by political and strategic planning, such as the Common Security and Defense Policy (CSDP), which is now integrated into the EU Common Foreign and Security Policy (CFSP), or the Stockholm agenda. Here the challenges are to identify «»»s between these guidelines and actions, with emerging/future technologies, to explore "dual use" technologies (defense tech applicable in civil security and the other way round) and to deliver more for less (pool resources, cloud-based solutions, data and info sharing, etc.).
- Interoperability and collaboration: HSD organizations are immersed in the development of NATO, EDA or other EU cooperation frameworks that span a variety of topics from counter-terrorism and crisis management to operational data exchange or cybersecurity. Objectives are to avoid duplication, pool resources and foster EU excellence.
- Exploiting "data deluge": increasing availability of useful information allows the acquisition of knowledge and development of new generation of intelligence applications needed to enhance situational awareness and agility in decision making.

Current Research Topics and Findings

- Innovation in Crisis Management, Resilience and Emergency services.
- Protection and Surveillance of Critical Infrastructures and Systems.
- Technologies and Processes for Border Control Management.
- Decision Support Systems applied to security.
- Chemical, Biological, Radiological and Nuclear related IT solutions.
- Complex event processing, different mining technologies (data, «»», opinion, audio...), data and context fusion, visual analytics.
- Design, modeling and simulation of forward-looking scenarios.
- Automatic image processing and recognition in high demanding scenarios.

Title	Project Title	Funding	Description	Web
ALFA	Advanced low flying aircrafts detection and tracking	H2020	Development of a surveillance system for timely detection and classification of air targets, providing a prediction of landing sites or dropping zones.	alfa-h2020.eu
BODEGA	Proactive enhancement of human performance in border control	H2020	Focuses on human factors in border lines to enhance the performance of border guards and the travelers' experience.	bodega-project.eu
CIVILEX	Supporting european civilian external actions	H2020	Model of the information systems in use within the EU Civilian missions and provide possible solutions for a future interoperable Situational Awareness, Information Exchange and Operational Control Platform.	civilex.eu
DRIVER	Driving innovation in crisis management for european resilience	FP7, SECURITY	Improving Crisis Management at Member State and EU level covering society resilience, strengthening first responders and training.	driver-project.eu
ResiStand	Increasing disaster resilience by establishing a sustainable process to support standardisation of technologies and services	H2020	Drafting a roadmap for the empowerment of Crisis Management and European disaster resilience through standardisation.	resistand.eu
TOXI-TRIAGE	Integrated and adaptive responses to toxic emergencies for rapid triage: engineering the roadmap from casualty to patient to survivor	H2020	It merges technologies from clinical medicine with practices of search and rescue into an integrated concept of operation for crisis management in a catastrophic CBRN incident.	toxi-triage.eu
ZONeSEC	Towards a EU framework for the security of widezones	FP7	Addresses widezones surveillance defining a European framework taking into consideration costs, complexity, vulnerability, societal acceptance and ethics.	zonesec.eu

Manufacturing & Retail

Intelligent technologies for manufacturing and retail challenges

Description

The Manufacturing & Retail sector has a deep experience and capacity in multiple areas: design and integration of Collaborative Platforms (i.e. for Meta-Products development covering communication tools, PLM, ERP, ALM, PMS, etc.), deployment and management of Manufacturing (Industry 4.0) solutions on the cloud, data acquisition from shop floor making use of smart objects.

Those solutions are developed mainly in the scope of Internet of Things (IoT) oriented to Manufacturing Ecosystems with special focus on Cyber Physical Production Systems (CPPS). They consider subsequent integration of data with different systems (consumers), customized application platforms for development, Big Data applied to manufacturing, security and cloud computing.

The retail sector is one of the biggest users of ICT, and thus a driver for innovation. It has a major role to play in the development of a sustainable economy and also in allowing citizens to face the current economic downturn by giving them easy access to affordable and good quality consumables.



Goals

The main goal is to help companies, in particular SMEs, to adapt to global competitive pressures by improving the technological base of manufacturing and retail across a broad range of sectors. This sector applies new IT advances to address the challenges and opportunities deriving from:

- The reduction in manufacturing timescales and acceleration of technological innovation with a customer centric approach fostered by Industry 4.0 paradigm.
- The growing need for sustainable, resource-efficient production with an improvement on production flow - lean factories.
- Food traceability and food chain integrity.
- New channels to provide the right information to customers while preserving their privacy and trust.
- Branding management and its impact on manufacturing process.

Main activities

We are interested in developing new solutions for a range of activities covering manufacturing processes, the factories of the future approach (Industry 4.0), food tracking & traceability, improvement of retailer business processes and client satisfaction through better information strategies. In particular, we focus on the following activities:

- Identification of research opportunities from national and international bodies aligned with Atos commercial divisions' needs.
- Technology transfer to improve Atos solutions.
- Exploitation activities to steer the research towards market needs and exploit research results.
- Commercial projects to final customers, including R&D support.



Jorge Rodríguez
Head of Sector

Challenges

The majority (99.8 %) of enterprises active within the EU-27's non-financial business economy in 2008 were SMEs and only a few of them have the research capacity and the financial potential to implement high-risk innovative manufacturing and retail technologies.

In this context a variety of challenges emerge:

- To develop Collaborative and Scalable Platform for Data visualization and analytics.

- To improve innovation activity. New ideas have to be transformed into new products and processes.
- Better knowledge of the context in the manufacturing process through any kind of sensor or CPPS to support decisions thus optimizing the full process and resources consumed.

- Ensure the food chain integrity ("from farm to fork") through tracking and traceability.

- To optimize retailer processes and its client satisfaction: Smart labels management, consumer geolocation, iBeacons and wearable technologies.
- Consumer apps development, App store, marketplace, and payment systems. Back office for applications development and commercialization.

Current Research Topics and Findings

- Sustainable, resource-efficient manufacturing.
- Production technology to exploit the potential of emerging technologies (in particular novel bio- and nano-technologies).
- Leveraging simulation and modelling techniques to address manufacturing challenges.
- Interoperability of the value chain IT systems and support to collaborative decision.
- Flexible, rapidly responsive production systems for customized manufacturing.
- Smart agrifood: Food chain integrity, making certain that food is traceable, safe to eat, high quality and genuine.
- New product information channels using mobile devices for supermarket clients.

Title	Project Title	Funding	Description	Web
C2NET	Collaborative cloud manufacturing networks	H2020-FoF	Development of cloud-enabled tools for supporting the supply network optimization of manufacturing and logistic assets based on collaborative demand, production and delivery plans.	c2net-project.eu
COMPOSITION	Ecosystem for collaborative manufacturing processes	H2020	Creation of a digital automation framework that optimizes the manufacturing processes by exploiting existing data, knowledge and tools to increase productivity and dynamically adapt to changing market requirements.	composition-project.eu
MIDIH	Manufacturing Industry Digital Innovation Hubs	H2020-FoF	Digitization of manufacturing industry, to boost investment and collaborations through strategic partnership and networking.	midih.eu/project.php
OCTAVE	Objective control of talker verification	H2020, SECURITY	Integration of a commercial-grade and new, hybrid automatic speaker verification (ASV) systems with the latest environmental robustness and anti-spoofing technologies to deliver a scalable, trusted biometric authentication service (TBAS).	octave-project.eu
OEDIPUS	Operate european digital industry with products and services	EIT-DIGITAL	High Impact Initiative (HII) belonging to the Digital Industry Action Line of EIT Digital and aimed at creating innovative solutions and business opportunities for European industrial players, corporations and SMEs.	eitdigital.eu
RepAIR	Future repair and maintenance for aerospace industry	FP7	Research on onsite maintenance and repair of aircraft by integrated direct digital manufacturing & development of a new set of technologies to maximize the benefits of 3D printing systems.	rep-air.eu

Media

New media and digital content management are strategic growth areas for Atos

Description

The Media sector encompasses two complementary perspectives:

- On one hand there is the media industry (broadcast, content production, press, etc.)
- and on the other, media and gaming technologies such as digital content management, 3D audio and video analysis, Big Data social media analysis, augmented and mixed reality etc.

In terms of clients, there tend to be either very large media conglomerates and/or broadcasters or small, agile technology companies.

Goals

The main goal is to improve the positioning of Atos in Media, New Media and Digital Content Management. These areas are quickly becoming a strategic growth area for Atos and this will drive the research topics of this sector with a strong market orientation. The design and development of ICT tools that support:

- Multi-platform efficient Media content management, search, retrieval and content distribution.
- Content recommendation and personalized advertising through content characterization, content annotation, datafusion and profiling.
- Rich multimedia user experience.
- Social network analytics.
- Non-leisure gaming and gamification technologies

Main activities

Besides participating in R&D projects, the Media sector supported Atos Major Events for the 2016 Summer Olympic Games in Rio de Janeiro, Brasil. It also contributed to the Olympic Broadcasting Services webcasting solution for the Winter Olympics 2014 in Sochi and for the second Youth Olympic Games in Nanjing.

We also follow the activities of the New European Media (NEM) initiative.



Challenges

The biggest challenge is to convert the extensive knowledge accumulated by this sector during last years in different R&D projects related to media technologies into assets that are useful to the rest of Atos Group.

The focus is on the following challenges:

- Content annotation and enriched metadata for multimedia.
- Multimedia search, distribution and retrieval.
- 3D and virtual worlds.
- Streaming (P2P, 3D, SVC, MDC, etc.).
- Social media analytics related to media content



Francesco D'Andria
Head of Sector

Current Research Topics and Findings

- Metadata, especially for sports (Mpeg, 7 MPEG 21, SportML, EventML, Major Events) Realtime recommender systems
- Personalized Content
- Multimedia search and retrieval
- P2P streaming
- Social media analytics
- Second Screen
- New user interfaces for access to multimedia (multitouch, Kinect, tablet)
- Digital archiving

Title	Project Title	Funding	Description	Web
CoNCEPT	Collaborative creative design platform	FP7	Implementation of a semantically driven collaboration framework to be integrated into future synchronous collaborative design environments to assist professional industrial designers on the early stages of the design process.	concept-fp7.eu
Flame	Facility for large-scale adaptive media experimentation	H2020	Development and operation of an experimental infrastructure for media content delivery that combines VSNs and ICN to optimize efficiency and user experience considering the expected demand patterns of the Future Media Internet applications & services.	flame-project.eu
ProsocialLearn	Gamification of prosocial learning for increased youth inclusion and academic achievement	H2020	Delivery of a series of disruptive innovations for the production and distribution of prosocial games that engage children and technology transfer from the games industry to the educational sector.	prosociallearn.eu
SMART	Multimedia search and retrieval over integrated social and sensor networks	FP7	Research and implementation of a scalable open source next generation multimedia search engine that will be able to search information stemming from the physical world.	smartfp7.eu
Trillion	Trusted Citizen - LEA collaboration over social networks	H2020	Open, flexible, secure and resilient socio-technical platform to foster effective collaboration of citizens and law enforcement officers.	trillion-project.eng.it

Public Administration

ICT is key to promote smart, sustainable & innovative government

Description

The sector builds on the results of previous research in the eGovernment and Education areas, and encompasses three complementary perspectives:

- Helping the public administrations to provide more efficient and effective public services to citizens and businesses.
- Developing solutions to enhance learning: Learning at the workplace, collaborative learning, learning at school, higher education, accessible learning, authoring tools and adaptive learning.
- Developing smart cities infrastructures that offer added-value services to citizens to cope with societal challenges and to enable business services.

Goals

- Research, design and development of ICT tools that support Public sector administrative processes to deliver seamless and faster public services.
- Adoption of emerging technologies that support new demands for services and contents in education.
- Design and deployment of new ICT tools and integration of existing technologies that allow emerging smart cities to offer sustainable and added-value services.



Main activities

- Management of market-driven projects with promotion of project results to Atos customers in the Public and Education sector.
- Integration of research results into the public administration legacy systems.
- Definition and assessment of new and efficient services for Smart cities, focused on convergence of physical and virtual infrastructures, and citizen participation.
- Development of ICT tools that implement more efficient services with special focus on interoperability, cross-organizational flows, big and open data, cloud for public administrations, and smart cities.
- Development of ICT tools with strong education orientation focused on personalization, student experience, lifecycle management, and contextualized eLearning.
- Identification and execution of new business opportunities in the Public and Education sector in line with innovative key offerings.



Ana María Piñuela
Head of Sector

Challenges

- Single European administrative space: Implement the vision of seamless cross-organizational and cross-border services through adoption of technologies.
- More for less: Explore solutions, constraints and applicability for clouds of public services and open source.
- Sustainable IT: Explore the role of public administration as an early adopter of technologies such as migration to IPv6, Green IT, etc.
- Open government: Releasing public data and using «»»ed data techniques to help people understand how government works and how policies are made.
- Explore how public administrations can leverage big data techniques to save money in operational efficiency.
- Connected government: Explore possibilities of IoT to improve efficiency and enable transformation of e-government processes.
- Learning environments based on serious games, education applications for mobile devices.
- Development, deployment and validation of sustainable and ICT-enabled added value services in smart cities, by leveraging existing technologies in different areas of activity with high potential benefit.

Current Research Topics and Findings

- Cross border authentication that allows citizens to access eGovernment services by using their national eID.
- Involvement of citizens in policy-making processes through innovative non-intrusive technologies.
- Participation of citizens in the policy development process and harmonization of policies across governmental levels (e.g. immigration policy).
- Implementation of web 2.0 government sites that allow interactive information sharing, interoperability and dynamic collaboration of different kinds of users.
- Adaptive learning experience for students, collaborative learning environments, learning/training strategies, platforms to support learning processes and training.

Title	Project Title	Funding	Description	Web
BDVe	Big data value ecosystem	H2020	Support the Big Data Value PPP in realizing a vibrant data-driven EU economy and support the implementation of the PPP to be a success.	big-data-value.eu
Policy Compass	Big Policy Canvas	FP7	Fosters collaboration among Public sector stakeholders and offers a solid knowledge base towards building a more evidence-based public sector, promoting transparency and restoring trust to public sector structures.	policycompass.eu
CEDUS	City enabler for digital urban services	EIT-DIGITAL	Provision of a software relying on the FIWARE open platform for crawling, collecting and rendering on a map valuable data at urban scale as well as rapidly developing urban services.	cedus.eu
ESPRESSO	Systemic standardisation approach to empower smart cities and communities	H2020	Development of a conceptual Smart Cities Information Framework, which consists of a platform and data provision and processing services to integrate data, workflows, and processes in applications relevant for Smart Cities.	espresso-project.eu
MaTHISIS	Managing affective-learning through intelligent atoms and smart Interactions	H2020	Integrated platform which provide capabilities for adaptive learning, automatic feedback, automatic assessment of learner's progress and behavioral state, affective learning and game-based learning.	mathisis-project.eu
NEWTON	Networked labs for training in sciences and technologies for information and communication	H2020	Building a pan-European learning network platform that supports fast dissemination of learning content to a wide audience in a ubiquitous manner.	newtonproject.eu
Science2Society	Improving university, industry and society interfaces to boost Europe's innovation stakeholders	H2020	Creation, piloting and sharing of good practices, guidelines and training materials to improve awareness and practical performance in university-industry-society interfacing.	science2society.eu
SONNETS	Societal needs analysis and emerging technologies in the public sector	H2020	Delivery of a methodological framework for Public Sector organizations to accelerate its transformation through the identification, analysis and take-up of emerging technologies.	sonnets-project.eu
STRATEGIC	Orchestrate next-generation e-government services	CIP	A cloud enabled framework on various infrastructures with a set of services related to public bodies, opening new horizons in the secure and private migration, adaptation, governance and development of public cloud services.	strategic-project.eu
Student Mobility Study	Feasibility study on cross-border use of eID and authentication services	Commercial Project	Study of the current landscape in the area of cross-border access to student services in the EU and the issues preventing wider adoption of systems facilitating this access.	

Telecom

Novel network architectures and virtualized software networks

Description

The Telecom Sector focuses on:

- Developing the technology for future 5G high-speed broadband and mobile network infrastructures.
- Contribute to Networld2020 ETP and the 5G PPP initiative (member of both Steering Boards).
- Foster the adoption of integrated networks as well as novel Internet architectures and technologies.

This sector seeks the definition and adoption of assets for the telecom industry through Atos sales channels.

Our main partners include key telecom industry players (such as Telefonica, Portugal Telecom, Telecom Italia, Deutsche Telekom, Nokia, Alcatel-Lucent, Ericsson, etc.), relevant European universities (UPC, UPM, NTUA, ...) and cutting-edge research centers (i2CAT, Fraunhofer, iMinds, ...)

Goals

- Explore novel network architectures - such as 5G - and the applications these enable.
- Study 5G enabling technologies such as Network Function Virtualization (NFV) and Software Defined Networks (SDN).
- Analyze the impact of virtualization on the telecom landscape, both from technical and business perspectives.
- Align the research activity with the offering and activities of Atos (Next Generation Intelligent Networks, Context-aware mobility, Cloud for Network Function Virtualization, OSS/BSS, etc.), studying new business opportunities for operators.



Main activities

From the innovation point of view, Atos is participating in initiatives that bring NFV closer to the market. As far as research is concerned, the combination of NFV and SDN for the construction of the 5G network is one of our main priorities.

The sector is currently involved in several exciting projects that cover a wide range of technological challenges such as NFV and SDN in the framework of 5G as well as Recursive Internet. In particular, we are very proud to participate in five of the first wave of European projects that are currently defining the 5G network to-be.

As an IT provider and system integrator with virtualization and cloud expertise, Atos expects to fully take advantage of 5G as a big opportunity for to become even more influential in the telecom sector and »»» our research results with Atos' global telecom portfolio.



Josep Martrat
Head of Sector

Challenges

- Next generation communication networks (5G) and innovative networking paradigms (Network Function Virtualization, Recursive Internet).
- Combination of cloud computing and networking: Cloud RAN and Mobile Edge Computing (MEC).
- Global telecom solutions (i.e. Big Data for network management) in complex and heterogeneous environments for ubiquitous and reliable service delivery.
- Evolution towards Telecom Single Market. Trends and regulations.

Current Research Topics and Findings

- Network Function virtualisation (NFV)
- Mobile Edge Computing (MEC)
- Large-scale federation of Future Internet facilities and services for experimental purposes.
- Recursive Internet paradigms.

Title	Project Title	Funding	Description	Web
5G NORMA	5G Novel Radio Multiservice adaptive network Architecture	H2020	Development of a novel mobile network architecture providing adaptability in a resource efficient way able to handle fluctuations in traffic demand resulting from heterogeneous and dynamically changing services and to changing local context.	5gnorma.5g-ppp.eu
5G-CROSSHAUL	The 5G Integrated Fronthaul/ Backhaul	H2020	5G integrated backhaul and fronthaul transport network enabling a flexible and software-defined reconfiguration of all networking elements in a multi-tenant and service-oriented unified management environment.	xhaul.eu
5GEx	5G Exchange	H2020	Enable collaboration between operators regarding 5G infrastructure services.	
FED4FIRE	Federation for FIRE	FP7	Open and easily accessible facilities to the FIRE experimentation communities, which focus on fixed and wireless infrastructures, services and applications, and combinations thereof.	www.fed4fire.eu
PRISTINE	Programmability in Recursive Internet Network Architecture for European supremacy of virtualised networks	FP7	Demonstration of programmable functions in a recursive internet environment for several use cases (security, QoS, congestion control).	ict-pristine.eu
SESAME	Small Cells Coordination for Multi-tenancy and Edge Services	H2020	Small cells for 5G equipped with computing capabilities are exploited for network management and service delivery enhancement.	www.sesame-h2020-5g-ppp.eu
SONATA	Service Programming and Orchestration for Virtualized Software Networks	H2020	SDK and a modular orchestrator of network services for bringing NFV closer to the market in the framework of 5G.	sonata-nfv.eu
T-NOVA	Network Functions as-a-Service over Virtualised Infrastructures	FP7	Design and implementation of an integrated architecture for the automated management of Virtualized Network Functions over Network/IT infrastructures.	www.t-nova.eu

Transport

Innovation is essential if supply-chain stakeholders are to remain competitive

Description

Logistics is the backbone of economic activity and growth. It represents 10-15% of global GDP, and has made enormous impacts in terms of globalization and free trade as both an enabler and as an outcome. Moreover, supply chains are highly productive of data and yet these data involve different information systems, different user requirements, different business models and different deployment trajectories.

The Transport & Trade Logistics sector covers a range of activities to deliver advanced IT services, fast and robust solutions for the implementation, integrating interoperability, security, resilience and real-time optimization that enables the cost-effective, green and secure transit of goods through the Global Supply Chain and the urban logistics environment. Supply chain innovation is essential if manufacturing organizations are to remain competitive.

Goals

Our research goals focus on achieving competitive advantage required by supply-chain stakeholders in times of rapid changes to have a clear understanding of the direction of change, challenges and its implications for business or supply chain mechanisms.

- Advanced technology research, development, testing and evaluation to evolve and improve the mechanisms, business and security in the transport of goods in air, land and sea environments.
- To collaborate and work on relevant research projects.
- To disseminate and transfer relevant research findings in the logistics domain.



Main activities

- Enable the interoperability and integration of systems, delivering cost reductions, greater efficiency and enhanced security.
- Development of enablers to unlock the real-time information exchange across suppliers, manufacturers, logistics providers and retailers without necessitating costly interfaces.
- Usage of open standards and lightweight communication mechanisms to expose a collaborative environment in the logistics sector.
- Encourage the exploitation of these best practice results through a targeted dissemination campaign aimed at decision makers in the logistics industry.



Germán Herrero
Head of Sector

Challenges

- Supply chain visibility and transparency - Accurate data.
- Enable the interoperability and integration of systems, delivering cost reductions, greater efficiency and enhanced security.
- Development of connectivity infrastructure for collaborative and efficient data sharing among all stakeholders in the logistics sector.
- Supply Chain Resilience - Develop the essential tools and processes necessary to create a capability of "design for resilience".
- Security and facilitation.

Current Research Topics and Findings

- Real-time Cloud Messaging AEON
- Global Operation Distribution System GOAL
- Urban logistics
- Green logistics
- Intermodal freight transport location based services
- Security in the supply chain
- Logistics Big Data
- Collaborative solutions as collaborative SCM
- Food supply chain optimization

Title	Project Title	Funding	Description	Web
AEOLIX	Architecture for european logistics information exchange	H2020	Cloud platform aiming to enable the data visibility and data sharing in end-to-end logistics, making the transport of goods across Europe more efficient and sustainable while reducing energy consumption by more than 30%.	aeolix.eu
AUTOMAT	Automotive big data marketplace for innovative cross-sectorial vehicle data services	H2020	Novel and open ecosystem in the form of a cross-border Vehicle Big Data Marketplace that leverages currently unused information gathered from connected vehicles.	automat-project.eu/
CO-GISTICS	Deploying cooperative logistics	FP7	Cooperative solutions for efficient and sustainable logistics across Europe, integration of existing freight and transport systems with innovative solutions such as cooperative services and intelligent cargo.	cogistics.eu
CORE	Consistently optimised resilient ecosystem in the supply chain	FP7	Integrates interoperability, security, resilience and real-time optimisation to produce cost-effective, fast and robust solutions that will guarantee the efficient and secure transit of goods through the worldwide Supply Chain.	coreproject.eu
FREVUE	Freight electric vehicles in urban Europe	FP7	Demonstration to industry, consumers and policy makers of how electric freight vehicles can provide a smart, clean and efficient solution to transport-related challenges currently affecting European cities.	frevue.eu
HOPE	Holistic personal public eco-mobility	FP7	Open platform capable of combining Interoperable Fare Management and Traveler Information Systems.	hope-eu-project.eu
NEWBITS	New business models for ITS	H2020	Provide a deep understanding of the changing conditions and dynamics that affect and/or influence C-ITS innovations.	newbits-project.eu
TT	Transforming transport	H2020	Big Data Value Lighthouse project working on finding a more efficient and more sustainable transport paradigm, to show concrete, measurable and verifiable evidence of data value that can be achieved in mobility and logistics.	transformingtransport.eu



Labs

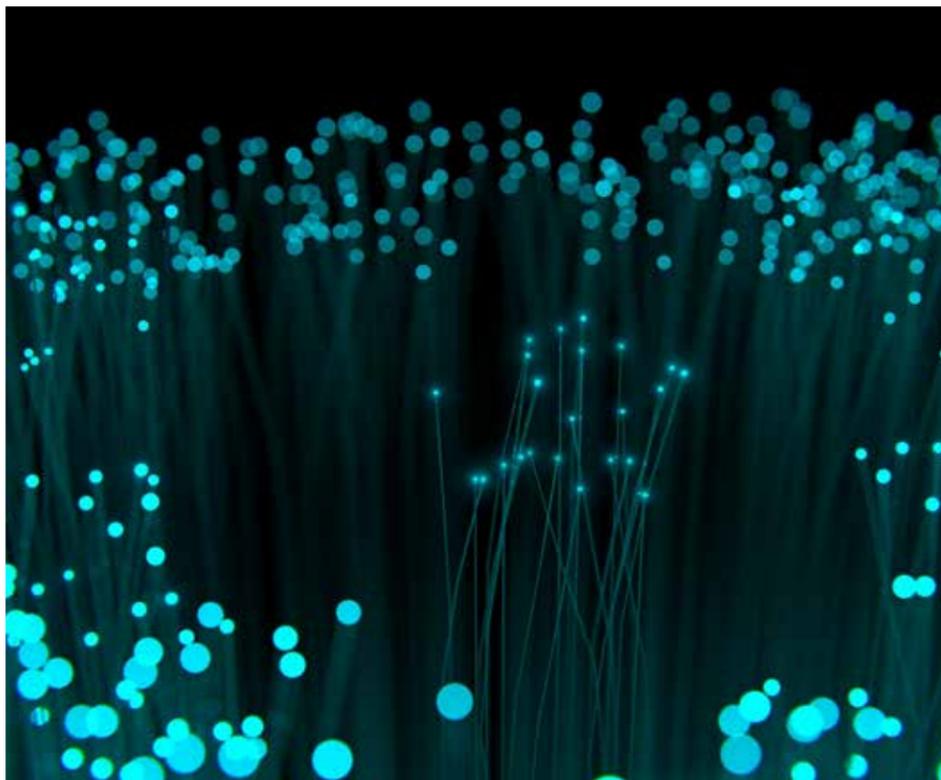
Advanced Parallel Computing

Enabling future parallel applications

Description

Many industrial scenarios require very advanced computation capabilities due to the big amount of data to be analyzed and to the complex calculations to be performed. High Performance Computing (HPC) is a technology that is bringing the industry to a new era through the use of simulations, advanced modeling and improved visualization to improve the engineering and manufacture of new products.

As the technology is evolving and the problems to solve become more complex, it is necessary to provide the technology for future exascale applications, which will have new requirements for scaling up the amount of resources to be used. HPC systems become more heterogeneous and aim at optimizing energy consumption.



Goals

The main objective of the research we carry out is to manage parallel computing resources in a smart way while, at the same time, we enable the usage of the technology:

- Optimize resources management for large systems, assigning the adequate resources to the applications to be run and dealing with non-functional aspects;
- Facilitate access to HPC resources, thanks to portals and frontends which hide the complexity to the end users;
- Create and adapt new tools able to use the parallel computation capabilities of HPC systems, especially in the field of parallel (real-time) data analytics;
- Research on new ways to perform parallel computation, learning how to use them.

Main activities

We are focused on solutions that can deal with the current issues in HPC, taking into account the coming problems in future Exascale systems while, at the same time, we are already working in solutions for extreme data analytics using parallel computing resources:

- Orchestration of applications for performing optimal deployments and execution, deriving some tasks to Cloud HPC resources whenever it is convenient;
- Provision of portals and front-ends for easy access and usage of HPC resources, integrating data management tools, experimentation tools, communities management and applications marketplace;
- Development of our parallel Complex Event Processing (CEP) engine for real-time data analysis, able also to work in low-power computing devices.



Javier Nieto
Head of Lab

Challenges

Technologies for Exascale Computation:

- Optimal resources management, allocating the right resources to the applications;
- Enable usage of highly scalable applications, taking into account potential bottlenecks;
- Deal with heterogeneous systems, adopting acceleration devices.

Easing the usage of HPC for different domains:

- Tools for large and complex data analytics, parallelizing data processing;
- Ease execution of experiments in different domains, giving transparent access to HPC;
- Find new application domains where HPC is a tool to exploit.

New technologies for parallel computing:

- New Quantum Computing technologies and quantum algorithms;
- Future Neuromorphic Computing solutions, as a new way of computation.

Current Research Topics and Findings

- Dynamic applications profiling and allocation for an optimal execution.
- Non-functional properties management (monitoring, energy-efficiency, QoS, etc.).
- Optimization of tasks scheduling, bearing in mind several aspects at the same time (i.e. network topology, accelerators availability, etc.).
- Usage of accelerators / heterogeneous devices (i.e. GPUs, FPGAs, ...).
- Hybrid HPC infrastructures with energy-efficient accelerators for HPCaaS.
- Parallel data analytics in (near) real-time, also in embedded HPC, with our parallel CEP.
- New programming models, domains specific languages, programming paradigms, etc. for parallel applications.

Title	Project Title	Funding	Description	Web
CoeGSS	Centre of Excellence for Global Systems Science	H2020	Advanced decision-support in the face of global challenges. It brings together the power of HPC and some of the most promising thinking on global systems in order to improve decisions in business, politics and civil society.	coegss-project.eu
EUxDAT	European e-Infrastructure for Extreme Data Analytics in Sustainable Development	H2020, EINFRA	Enabling users to fully benefit from underlying High Processing capacities to explore new methods, build new innovative services and to perform predictions and simulations with extremely large and heterogeneous datasets.	euxdat.eu
MSO4SC	Mathematical Modelling, Simulation and Optimization for Societal Challenges with Scientific Computing	H2020	Provision of an eInfrastructure focused on the optimized execution of Math Application Development Frameworks used in social science, done with a customized orchestration for OpenMP, MPI and large parallel applications.	mso4sc.eu

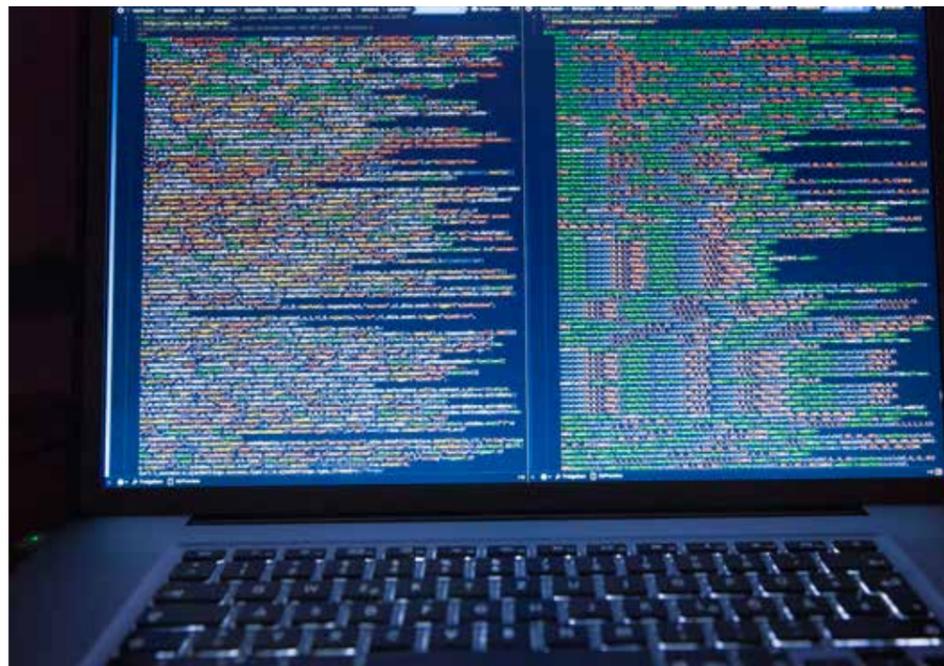
Cybersecurity

Addressing security, trust and privacy to ensure the security of citizens and organizations

Description

Trustworthy, secure and reliable ICT systems are crucial for a wide take up of converging digital services and a global requirement for the reliable and undisturbed functioning of our information society.

In this scenario, the Cybersecurity (CS) lab is an interdisciplinary group that conducts research in trust, security and privacy domains for the improvement of information technology security, as well as the increase of trust and dependability in systems and services.



Goals

Our ambition is to coherently address security, trust and privacy from a technological perspective, in an effort to ensure innovation in the field of secure software development, secure service composition, and secure service delivery. The goal is to find solutions for ensuring the security of citizens and organizations from threats such as terrorism, natural disasters and crime, while respecting fundamental rights, such as privacy.

Our research areas include, among others: cyber security, compliance & policy management, secure software engineering, security in virtualized environments, automated reconfiguration of security and high performance Security Information and Event Management (SIEM) systems.

Main activities

- Innovative security mechanisms (e.g. dynamic or adaptive features).
- Compliance & Policy Management.
- Security event and information management infrastructure (e.g. evidence-based policy enforcement, including security/privacy event monitoring, collection and assessment).
- Security methodologies and frameworks (e.g. risk assessment and secure software development).
- CyberSecurity: fight against malware and botnets, improved resilience against cyber threats.



Rodrigo Diaz
Head of Lab

Challenges

- Security of IoT and IIoT devices.
- Critical Infrastructures protection
- Security in shared service applications and infrastructures such as Cloud.
- Applying Machine Learning to Advance Cybersecurity Analytics.
- Security & Privacy in Social Networks.
- Security of ICT in large distributed IT systems (sensor networks, interconnected critical infrastructures).
- Information exchange, interoperability and data fusion for situational awareness.
- Context-aware security and context-aware privacy protection.
- Digital forensics (e.g. forensics in Cloud).

Current Research Topics and Findings

- IoT/IIoT Security
- Distributed Ledger Technology & Cybersecurity.
- Machine Learning for Cybersecurity Analytics.
- Trust (establishment of trust relations, management of trust).
- High Performance Security Information and Event Management (SIEM).
- High Performance Compliance Management, including: Evidence Collection, Compliance Assessments and Accountability.
- Privacy by Design, Context-aware privacy enhancement and privacy preservation.
- Security for Virtualized environments.
- Secure Software Engineering.
- Automated Reconfiguration of Security.
- Risk and cost-driven security decision making.
- Prevention of crime and efficient collaboration of police forces.
- Data protection technologies and applications.
- Botnets detection and mitigation.

Title	Project Title	Funding	Description	Web
ANASTACIA	Advanced networked agents for security and trust assessment in CPS / IoT architectures	H2020	A holistic solution enabling trust and security by-design for Cyber Physical Systems (CPS) based on IoT and Cloud architectures.	www.anastacia-h2020.eu
CIPSEC	Enhancing critical infrastructure protection with innovative security framework	H2020	Creation of a unified security framework that orchestrates state-of-the-art heterogeneous security products to offer high levels of protection in Information Technology and Operational Technology departments of Critical Infrastructures.	cipsec.eu
COMPOSITION	Ecosystem for collaborative manufacturing processes	H2020	Creation of a digital automation framework that optimizes the manufacturing processes by exploiting existing data, knowledge and tools to increase productivity and dynamically adapt to changing market requirements.	composition-project.eu
DISIEM	Diversity enhancements for security information and event management	H2020	Enhance existing SIEM systems with diversity-related technology to improve the quality of events collected, add support for collecting infrastructure-related information, create new ways for visualising the information, and allow the use of multiple storage clouds for secure long-term archival.	disiem-project.eu
SMESEC	Cybersecurity for small and medium-sized enterprises	H2020	Develop a cost-effective suite of cyber-security tools to support SMEs in managing network information, security risks and threats while identifying opportunities for implementing secure, innovative technologies for the digital market.	smesec.eu
STOP-IT	Strategic, tactical, operational protection of water infrastructure against cyber-physical threats	CIP	Focuses on the strategic, tactical and operational protection of critical water infrastructures against physical and cyber threats by bringing together a strong team of partners from Europe and Israel to develop solutions to the most pressing threats.	stop-it-project.eu
TREDISEC	Trust-aware, reliable and distributed information security in the cloud	H2020	Unified framework where resulting primitives are integrated, while following the end-to-end security principle as closely as allowed by functional and non-functional requirements.	tredisec.eu
WISER	Wide-impact cyber security risk framework	H2020	Place cyber-risk management at the heart of good business practice, benefiting multiple stakeholders through the provision of a cyber-risk management framework able to assess, monitor and mitigate risks in real-time, in multiple industries.	cyberwiser.eu

Data Intelligence

Helping to manage data by researching on Big Data, AI, Semantics and Linked Data

Description

Artificial Intelligence and Big Data are probably the most important technologies related to the digital transformation quest. AI, powered by the massive amounts of data that we have at our disposal today, will be anywhere: In our mobile phones, in our homes, in the cities, in our daily work. It is a technology that will change radically our way of living, which poses not only technical, but societal and legal issues.

The D.I. Lab is researching in AI and data-related subjects to understand how different stakeholders (businesses and governments, citizens and patients, industries and cities) can benefit of these promising technologies.



Goals

The main objective of our research is to apply the technology to real scenarios where the innovation on AI and Big Data can be of interest for our customers and the society.

- Artificial Intelligence: From Machine Learning to Deep Learning to the multiple applications of the technology to real-world applications and challenges.
- Big Data: We have a strong background in almost all aspects of the Data Value Chain as well as data architectures.
- Semantics: Proven track record on the application of Cognitive Computing and Knowledge Graphs in collaboration with AI and Big Data.
- »»»ed Data: Application of the »»»ed Data paradigm for data publication and »»»ing.

Main activities

We believe there is no solution that fits-it-all, but general good architectural principles and best practices combined with an excellent knowledge of available tools and new research trends, make the difference between success and mediocrity.

- We develop AI solutions based on machine learning and deep learning in the scope of data analytics projects.
- Of particular interest for us are the architectures, frameworks and techniques that are the foundations of any data-intensive related applications.
- We have developed a Social Network monitoring tool called Captorean that is the cornerstone of our knowledge transfer to commercialize research and innovation results.
- We have an extensive track record in projects and solutions dealing with Semantic Technologies, Cognitive Computing, Knowledge Graphs and NLP.



Tomás Pariente
Head of Lab

Challenges

- Artificial Intelligence
 - Understanding the best ML algorithms for different tasks and in different computing platforms.
 - Usage of Deep Neural Networks in different application fields.
 - Data-bias and responsible AI.
- Big Data
 - Understanding how and when to use big data in combination with HPC, Cloud and Edge Computing.
 - Architectural approaches to deal with massive amounts of historical and streaming data in a coherent manner.
- Semantic Technologies
 - Knowledge Graphs and their application to AI.
 - Formal semantics in the Data Value Chain.
 - »»»ed Data and Open Data.

Current Research Topics and Findings

- Automatic deployment of Big Data architectures, components and services.
- Cross-domain data integration.
- Deep learning and Deep Neural Networks.
- Stream processing and stream analytics.
- Interpretation and analysis of unstructured textual resources using Natural Language Processing, Machine Learning and Data Mining techniques.
- Usage of »»»ed Data open tools for data publishing and »»»ing.

Title	Project Title	Funding	Description	Web
ACANTO	A cyberphysical social network using robot friends	H2020	Using robots to increase the number of older adults who engage in a regular and sustained physical activity.	ict-acanto.eu
CoeGSS	Centre of excellence for global systems science	H2020	Advanced decision-support in the face of global challenges. It brings together the power of HPC and some of the most promising thinking on global systems in order to improve decisions in business, politics and civil society.	coegss-project.eu
CrowdHealth	Collective wisdom driving public health policies	H2020	Integration of high volumes of health-related heterogeneous data from multiple sources with the aim of supporting policy making decisions.	crowdhealth.eu
PHEME	Computing veracity across media, languages, and social networks	FP7	Combination of big data analytics with advanced linguistic and visual methods. The results will be suitable for direct application in medical information systems and digital journalism.	pHEME.eu
QROWD	Making transport smarter, leveraging the human factor	H2020	Methods to perform cross-sectoral streaming Big Data integration including geographic, transport, meteorological, cross domain and news data, while capitalizing on human feedback channels.	qrowd-project.eu/project
TOREADOR	Trustworthy model-aware analytics data platform	H2020	Aims at overcoming some major hurdles that until now have prevented many European companies from reaping the full benefits of Big Data Analytics.	toreador-project.eu

Identity & Privacy

Securing corporate & personal identity in cyberspace

Description

Secure identity and privacy technologies are key enablers for citizens to interact safely in our Digital Society and for businesses addressing Digital Transformation / Industry 4.0. They allow to efficiently protect who and what we are, addressing -in all aspects of life involving ICT and online services- fundamental human rights and freedoms including the right to personal data protection.

Both the assurance of identity data security and advanced privacy protection create key competitive advantage for Atos and for our public and private partners, having in focus both end-user and customer concerns in this regard and the existing threats which create social alarm and hamper trust in eServices of global digital markets and ICT systems in general.

Our vision is all-encompassing and considers the role of identity and privacy in the context of the latest areas of technological innovation in close interaction with other ARI teams.



Goals

- Provide, through secure identity schemes for interoperable Identity and Access Management and the protection of identity-related (in compliance with regulatory frameworks such as the GDPR or eIDAS), the basic enablers of trust and security that all stakeholders in the eServices value chains, need.
- Focus on innovative technological trends in all areas to serve the needs of the R+I sectors offering trustworthy solutions and assets and fostering competitive advantages in an increasingly complex and distributed environment.
- Provide advanced and customized eID privacy solutions, that can achieve for Atos customers compliance with regulatory requirements, more efficiency, competitive advantage, reduced fraud and enhanced trust and cooperation with public and private stakeholders.

Main activities

- Electronic Identity Management Technologies
- Digital/Electronic Identity Technologies
- Cryptography and Electronic Trust Services
- Identity and Access Management
- Data Protection by Design and Privacy Engineering Methodologies
- Border Control & Biometrics.

Challenges

- Interoperable eID and managed IAM solutions will be key enablers of secure and seamless access to eServices (e.g. CEF eID and eIDAS).
- eID, eIDM, trust services, advanced cryptography and privacy/security-by-design as fundamental enablers of Trust in Future Internet & Cloud.
- Complex Identity Federation & Data Exchange Scenarios, including scenarios involving Big Data, Cloud Computing and/or IoT.
- Simultaneously strong (multi-factor) and user-friendly authentication.
- Identity & Privacy Assurance.
- Auditing and Compliance.



Alberto Crespo
Head of Lab

Current Research Topics and Findings

- Privacy-enhancing technologies and advanced cryptography approaches as building blocks for privacy-enhancing identity management and data management in trusted and untrusted domains, data protection provider approaches and technological facilitators for regulatory compliance.
- Identity Management-as-a-Service (IDMaaS) & Networked Identity services composable with other services in the Cloud (identity as a commodity).
- Efficient, integrated and smart border control solutions facilitating information sharing across large systems.
- Privacy-by-Design (PbD) including Privacy Impact Assessment, cost & value of privacy compliance, data protection in context of Big Data applications, full identity data lifecycle management.
- Biometrics: Crypto-biometrics, Cancellable biometrics, Mobile biometrics.

Title	Project Title	Funding	Description	Web
ABC4EU	Automated border control gates for Europe	H2020	Makes border control more flexible by enhancing the workflow and harmonizing the functionalities of Automated Border Control (ABC) gates and other Border Control Processes, aligned with Smart Borders Package of the EU.	abc4eu.eu
ARIES	Reliable european identity ecosystem	H2020	Comprehensive framework and holistic approach of technologies, processes and security features for reliable e-identity ecosystem to improve identity, trust and security, with better support to law enforcement.	aries-project.eu
CREDENTIAL	Secure cloud identity wallet	H2020	Innovative cloud based services for storing, managing, and sharing digital identity information and other personal data. It relies on combination of strong hardware-based multi-factor authentication with end-to-end encryption.	credential.eu
DAPHNE	Data-as-a-Service platform for healthy lifestyle and preventive medicine	FP7	Development of a platform to deliver personalized guidance services for lifestyle management to the citizen/patient.	daphne-fp7.eu
FIDES	Federated identity management system - Phase II	EIT-DIGITAL	Platform with secure cross-platform identity management system (mobile/desktop), consolidation into a production environment in three national contexts with a sustainable business model.	
FOODIE	Farm-oriented open data in Europe	CIP	Open and interoperable agricultural specialized platform hub on the cloud for the management of data relevant for farming production.	foodie-project.eu
LEPS	Leveraging eID in the Private Sector	Connecting Europe Facility (CEF)	Enables private sector electronic services providers to connect to the Pan-European eIDAS infrastructure for cross-border electronic identification and authentication.	leps-project.eu
LIGHTest	Lightweight infrastructure for global heterogeneous trust management in support of an open ecosystem of stakeholders and trust schemes	H2020	Global, cross-domain trust infrastructure that renders it transparent and easy for verifiers to evaluate electronic transactions and make domain-specific trust decisions.	lightest.eu
MoveUS	ICT cloud-based platform and mobility service: available, universal and safe for all users	FP7	Changing European users' mobility habits by offering intelligent and personalized travel information services to suggest the best transport choice and provide feedback on energy efficiency savings.	moveus-project.eu
PIME	Personal information management ecosystems	EIT-DIGITAL	Modular, scalable privacy tool offering patients a dashboard that shows which caregivers have accessed their data and when. Security features include strong multi-platform authentication, authorization and audit.	
PRISMACLOUD	Privacy and security maintaining services in the cloud	H2020	Enable end-to-end security for cloud users and provide tools to protect their privacy with the best technical means possible - by cryptograph.	prismacloud.eu
STRATEGIC	Orchestrate next-generation e-government services	CIP	A cloud enabled framework on various infrastructures with a set of services related to public bodies, opening new horizons in the secure and private migration, adaptation, governance and development of public cloud services.	www.strategic-project.eu
WITDOM	Empowering privacy and security in non-trusted environments	H2020	Automatic and efficient privacy provisioning solutions, keeping data confidential in the un-trusted environment, while the data owner can operate with and make use of the data in the encrypted domain.	witdom.eu

Internet of Everything

Making life easier from a complex IoE world

Description

In recent years the potential Internet of Things technologies have acquired high attention and gained further recognition as key enabler for citizen centric business generation in different application areas, such as Smart Cities, Smart Energy and Environmental Management and Protection, Smart Industry and Factories of the Future, Smart Home and Assisted Living, Public Safety, Agriculture and Tourism. The Internet of Everything concept goes one step forward involving People, Process, Data and Things under the same scope.

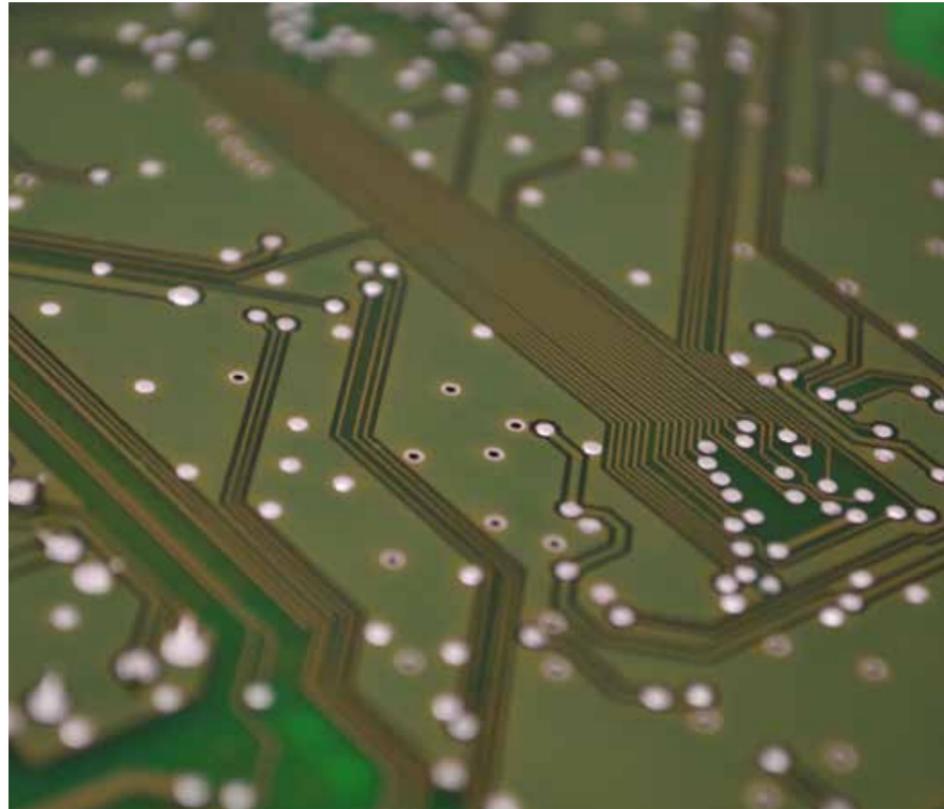
We currently understand the Internet of Everything as a paradigm considering the pervasive presence, in any context of the human activity, of sensing and actuating physical devices and ICT objects that are addressable, interconnected, and able to communicate and cooperate with each other.

Atos has a clear IoT end to end strategy aligned with the Group strategy, from IoT services to IoT platform. IoE will enable and empower our clients on their digital transformation journey and develop competitive advantage. The new IoE paradigm is not only about gathering data from objects, is about using these data in better decisions and integrated in the business processes.

We strongly support the usage of standard and open web technologies to construct the Internet of Everything. The openness in technologies ensures that implemented standards are used without barriers, enabling freedom for researching, deployment and creation of new business models in a digital world.

Goals

- Provide a full operative IoE platform capable of connecting People, Process, Data and Things in a standard, scalable and decoupled way. The resulting ecosystem enables multiple domain business and applications through a set of services for real time communications, data storing, monitoring, statistics, etc.
- Foster Open Standard Web technologies to create services, platforms and applications focusing on the growing needs of interoperability. IoT open standards interoperability is necessary for market adoption and horizontal solutions.
- To support interoperability and Open Standards, the European FIWARE Platform is used to implement IoT scenarios, taking advantage of the IoT Generic Enablers and NGSI Data Standard.



Main activities

At technical level we focus on developing a complete IoE platform where the embedded devices are complemented with the new landing of tiny computers and any kind of sensors. Smart gateways virtualize sensors (devices, actuators, etc.), powering them with connectivity capabilities and adaptable behavior. They act and react intelligently thanks to the analysis of surrounding data and communicate to the world through different services and integration frameworks.

We participate in technological research activities looking both for deriving user situation-aware application requirements in real time and for producing virtualized IT object models and integration frameworks equipped with advanced features. Virtual IT objects become robust and reusable in a broader IoE service context and easily integrable with other platforms and services.

At the business modeling research level, our aim is to abstract technological heterogeneity of vast amounts of diverse real work addressable objects, to enable their use for enhancing IoE services and applications, and the involvement of

cross-domain actors in multi-sided business platforms. Initiatives, results and trends in synergy research domains like cloud computing, big data and social networking are also carefully followed and applied as further foundations for our IoE modeling and integration efforts.

Last year we have started a new research line about managing the huge heterogeneous ecosystems in IoT scenarios.



José Gato
Head of Lab

Challenges

Some of the pending achievements towards a mature implementation of the IoE paradigm are:

- Faster software developments and solutions using a complete ecosystem guided by common open standard technologies and architecture.
- The business of Open Standard APIs: implementing and exposing services and tools through APIs as a product. Restful interfaces support this approach making use of HTTPS protocol as standard for M2M, M2I, V2X, etc.

- Semantic interoperability of sensor information exchange models in heterogeneous environments.
- Adoption of governance mechanisms fostering innovation, trust, and fair data ownership management, while respecting security, privacy and complexity of new IoE environments.
- Bringing "agile developments" and "continuous integration" methodologies to provide deployment of large-scale environments.

- Development of sustainable business embracing the full potential of the Internet of Everything.
- Participate in R&D programs to propose innovative security environments.

As a key actor in the European IoE research landscape, our lab provides technological contributions to the solution of the mentioned issues aiming at ensuring wider adoption and implementation of the IoE paradigm.

Title	Project Title	Funding	Description	Web
AGILE	Adaptive Gateways for Diverse Multiple Environments	H2020	Modular hardware and software gateway for IoT with support for protocol interoperability, device and data management, IoT apps execution, and external Cloud communication.	agile-iot.eu
CREATE-IoT	CREATE-IoT	H2020	Stimulating collaboration between Internet of Things initiatives, foster the take up of IoT in Europe and support the development and growth of IoT ecosystems based on open technologies and platforms.	european-iot-pilots.eu/project/create-iot/
ESSENCE	Empowering Safer homes for Senior through Connected Technologies	EIT-DIGITAL	Solution for smart living and e-inclusion that can assist elderly people, predict danger and react to minimise risk in these situations.	
iKaaS	Intelligent Knowledge-as-a-Service	H2020	Intelligent, privacy preserving and secure Smart City Platform based on a Big Data resource and an analytics engine.	ikaas.com
VICINITY	Open virtual neighbourhood network to connect IoT infrastructures and smart objects	H2020	Development and demonstration of a bottom-up ecosystem of decentralised interoperability of IoT infrastructures called virtual neighborhood, where users can share the access to their smart objects without losing the control over them.	vicinity2020.eu/vicinity

Next Generation Cloud

Contributing to Atos innovation strategy with regards to Cloud and Edge computing

Description

Computing is becoming increasingly pervasive in all aspects of our life, as "connected things" become more "intelligent things" bringing the need of fully networked computing systems capable of delivering advanced behaviours and interacting with their surroundings. Soon sensors, robots, drones, routers, servers and cars will only be seen as particular forms of infrastructure elements. This way, computing will no longer be constricted to specific devices but will be virtually embedded and pervasive to everything, enabling an unprecedented computing continuum.

Cloud computing initially emerged in the space in which we transitioned from an era in which underlying computing resources were both scarce and expensive, to an era in which the same resources started to be cheap and abundant, enabling the democratisation of computing and providing the illusion of infinite computing. Today we are observing new forms of Cloud Computing, such as Edge and Fog, starting to break the Data Centre barriers so to provide novel forms of computing embracing power and data resources increasingly available everywhere. The new forms of Cloud are making the Cloud concept evolve a more distributed approach in order to lead to better performance and enabling wider diversity of application and services, complementarily to existing multi-cloud and hybrid cloud models.



Goals

Gains in complexity of the connected "intelligent things" will pose specific requirements to Cloud Computing evolution. The self-contained and self-sustaining nature of these resources combined with their size and energy harvesting constrains will require of novel computing and communication architectures.

Developing cloud computing technology compatible with the management of hardware heterogeneity will call for finding ways to optimally endeavour heterogeneous special purpose processing units without losing the advantages of abstraction in utility based models such as development of sharing schemes and heterogeneity-aware scheduling at resource and platform levels.

The advent of fully distributed collaborative Cloud environments is another source of disruption in order to fully exploit computational power of "intelligent things". These environments

are initially taking for in the evolution of Ad-hoc Clouds enabling smart collaboration among mobile devices. Further evolution of this concept will enable the creation of dynamic ecosystems, meshes or swarms of "Intelligent Things". These will allow the creation of dynamic eco-systems encompassing "intelligent things", cyber-physical devices, edge and clouds, each of these adding to the collective capability and insight under the term Swarm Computing.

The main goal of this lab is to contribute to Atos research and innovation strategy with regards to Cloud, Edge and Swarm computing developments, models and architectures.



Ana María Juan Ferrer
Head of Lab

Main activities

- Advanced capabilities for IaaS, PaaS and SaaS: Accounting and monitoring; Autonomic resource management; SLA management; Multi-cloud environments IaaS, PaaS and SaaS; Experimental Facilities in Cloud; and Eco-efficiency in Clouds and Data Centres
- Service Management and Engineering: Advanced Service Architectures and SaaS; Cloud Service Composition, aggregation and orchestration; Service, Application and Data Marketplaces; Trust & Reputation Service Management; and License Management
- Edge computing: Heterogeneous / Things virtualisation management; Ad-hoc Cloud management; Application offloading; Local Cloud Management; Data Management; and Service Orchestration

Challenges

- Cloud Hybrid models: Interoperation, Portability, Federation and Brokerage
- SLAs, Trust and License Management for Cloud environments
- Integration of edge and mobile devices into decentralized Cloud architectures for IoT services
- Energy efficiency in heterogeneous computing environments, Cloud computing and Data centers
- Big Data Storage and scalability in Big Data processing
- Cloud-based Experimental facilities
- Autonomic and self-healing capabilities for Cloud management
- Cloud Service composition, aggregation and orchestration
- Cloud Marketplaces, Vertical markets, Added-value services and Applications
- Cloud Standardization and Compliance
- Scalability based on predictive models and including heterogeneous resources
- Heterogeneous and autonomic resource management

Current Research Topics and Findings

- Cloud Service Integration / Multi-Cloud: Improved mechanisms for QoS and SLA Management; Scalability; Multi-tenancy / Isolation; Cloud Migration; Application deployment Automation; Improved Cloud Monitoring; Interoperability and Multi-Cloud Provisioning; Cloud Networking; Economy, Cost, Trust and Reputation models; Cloud-marketplaces; and Eco-efficiency
- Edge (Fog) Computing: Management and heterogeneity; Across Edge execution orchestration; Interoperability and standardization; Off-loading optimization; Edge computing communication topology automation; and Support for heterogeneous and geographically distributed systems
- DeW Computing: Edge / Fog Service Management; Admission Control; Data abstractions and movement; and Edge Workload management
- Development areas for Computing Continuum: Swarm management; Cyber-physical Cloud/Edge computing; and Cloud/Edge Robotics

Title	Project Title	Funding	Description	Web
AGILE	Adaptive gateways for diverse multiple environments	H2020	Modular hardware and software gateway for IoT with support for protocol interoperability, device and data management, apps execution, and external Cloud communication.	agile-iot.eu
BASMATI	Cloud brokerage across borders for mobile users and applications	H2020	Development of an integrated Brokerage Platform targeting federated clouds in order to support dynamic needs of mobile applications and users.	
CloudSocket	Business and IT-Cloud Alignment using a Smart Socket	H2020	Introduction of the BPaaS concept thanks to smart alignment techniques, packages BPaaS as "extended Cloudlets" autonomously deployable and including adaptive rules to appropriately react in a multi-cloud environment.	cloudsocket.eu
DITAS	Data-intensive applications improvement by moving data and computation in mixed cloud/fog environments	H2020	Propose a framework, composed by an SDK and an execution environment to overcome the barriers that hamper the adoption of Cloud Computing and increase the adoption of Fog computing by exploiting the full potential of these two paradigms.	ditas-project.eu
INDIGO-DataCloud	Integrating distributed data infrastructures for global exploitation	H2020	Development of an innovative cloud platform for the scientific community based on open source software and providing access without restrictions to a diversity of e-Infrastructures.	indigo-datacloud.eu
mF2C	Towards an open, secure, decentralized and coordinated Fog-to-Cloud management ecosystem	H2020	Design an open, secure, decentralized, multi-stakeholder management framework, with novel programming models, privacy and security, data storage, service creation, brokerage solutions, SLA policies, and resource orchestration methods.	mf2c-project.eu
RAPID	Heterogeneous secure multi-level remote acceleration service for low-power integrated systems and devices	H2020	Development of an efficient heterogeneous cloud computing infrastructure, which can be used to seamlessly offload CPU-based and GPU-based tasks of applications running on low-power as well as more powerful devices over a heterogeneous network.	rapid-project.eu
sybIoTe	Symbiosis of smart objects across IoT environments	H2020	Fostering a simplified IoT application and service development process over interworking IoT platforms.	sybiote-h2020.eu
TANGO	Transparent heterogeneous hardware architecture deployment for energy gain in operation	H2020	Control of underlying heterogeneous hardware architectures, configurations and software systems while providing tools to optimize various dimensions of software design and operations.	tango-project.eu

Research Lines

A satellite with solar panels is shown in orbit over a desert landscape. A white line graphic starts from the text 'Research Lines' and points towards the satellite. The background shows a brown, arid terrain with intricate patterns of erosion and a dark blue sky.

Geospatial Applications

Living in a spatially-enabled world

Description

Relation to current technological trends:

- Cloud computing, Big Data and HPC - Moving existing geospatial solutions in different domains to the cloud and Big Data paradigm in order to accommodate to customers needs in terms of scalability and performance of the solutions:
 - Open data for precision farming agriculture.
 - Storage and (near) real-time analysis of large amounts of vector based-data (e.g. VGI, sensor observations) and satellite imagery using traditional database approaches as well as big data tools.
 - Early warning systems on the cloud for increased performance and interconnection in Crisis Management.
 - HPC for real-time execution of complex calculation and scientific models (e.g. tsunami simulations).
- Internet of Things (IoT) and Smart Cities
 - Location awareness IS a core component of the Internet of Things.
 - Sensor management/data access through OGC SWE standards (Working group in OGC to align SWE with IoT approach).
- Use of GIS open-source technologies
 - Web Map Clients: Leaflet, OpenLayers, Cesium.
 - GIS Web Services (involving visualization, download and processing geospatial capabilities): Geoserver, Mapserver.
 - Processing libraries: Python (Pandas, SciPy, PySpark, NumPy), Java (Geotools), Scala (Getrellis, Geomesa), R.
 - Databases: PostGIS, Rasdaman, Apache Accumulo, MongoDB.



Critical Mass / Market

- Expertise in GIS technologies and standards, which have been applied in different projects/domains (eg. OGC, INSPIRE, GEOSS, ORCHES-TRA).
- Expertise in the Environmental and Crisis Management domains.
- Strong partners network in the GIS community.
- Experience in integration of sensor data.
- Shifting to big data/cloud paradigm (experience being gained in FOODIE, DataBio, CLARITY, EUXDAT projects).

Relation with Atos Portfolio

- Solutions/Projects are clearly aligned with Atos business areas and can provide support for bidding opportunities
 - Environment and Agriculture (eg. Spanish Ministry of Environment and Agriculture) with FOODIE, ENVIROFI, DataBio and EUXDAT projects.
 - Development of Climate Service solutions in support of decision-makers and infrastructure (urban and transport) planners.



Miguel Ángel Esbri

Software Engineering

Improve your productivity, release better quality software

Description

- Model Driven Software Engineering (Design-Time)
 - MDA/MDE forward engineering techniques and methods applied to the specification, program-comprehension, re-engineering (design-pattern driven) of software systems and code synthesis.
- Software modeling and simulation (Run-time)
 - Research on techniques and methods that enable the specification and modeling of concerns on complex software systems and their simulation at model level, exploring the solution space.
- Aspect Oriented Software Engineering/Modeling
 - AOP/AOM techniques applied to the management of cross-cutting concerns, interweaving in complex software systems.
- DSL based software modeling and development: code generation and optimization. DSL applicability to HPC, embedded systems and IoT
 - Development of model-based domain specific language supporting the modeling, optimization and code synthesis of software for different software domains.
- Vector Programming/Parallel programming
 - Co-design development of techniques and tools that simplifies the adoption of vector/Parallel programming in software development, exploiting the full potential of new CPU/GPU for desktop/laptop applications.
- Advanced User Interface design and development
 - Development of techniques and methods simplifying the design and development of advanced user interfaces in a computing continuum, regardless the platform.
- Run-time dynamic adaptation
 - Research on techniques and methods enabling autonomous, context-aware applications, supporting self* features, such as self-adaptation, self-healing, self-reconfiguration, etc.
- OSS Community development
 - Development of techniques, methods and tools enabling a collaborative software development lifecycle.
- Choreography Service composition
 - Research on choreography techniques enabling a de-centralized coordination of software agents in mutual collaborations.



- Search-based software engineering
 - Research on software optimization techniques aiming at improving software engineering evolution and maintenance. Automatic exploration of solution space and mapping to the problem space.
- Software architectures and methodologies
 - Research on new software architectures and methodologies, including programming paradigms (functional programming, etc.).
- Enterprise Application Integration, middleware
 - Development techniques and tools enabling the interoperability of software systems, applied to EAI.
- Advanced Software Engineering automation techniques
 - Research on the automation of software engineering techniques and methods, covering the entire software engineering live-cycle, particularly supporting software maintenance.
- Test Driven Development
 - Engineering of software systems driven by early testing and specification.
 - Test driven DevOps.
- Test Amplification
 - Unit test amplification by strong mutation.
 - Unit test and oracle amplification.
 - Test configuration amplification: constraint satisfaction and optimization.
 - Test configuration enactment in DevOps.

Critical Mass / Market

- Several years of expertise in software engineering technologies and standards which have been applied in different projects/domains, including:
 - FP6: SECSE, MOMOCS
 - FP7: NEXOF-RA, SOA4All, Qualipso, Cloud-4SOA, MARKOS, ARTIST
 - H2020: SUPERSEDE, MegaM@RT2, STAMP, ELATEST
- Participation in Software Engineering initiatives: NEXOF Software Engineering, Software Engineering Cluster
- Main Assets:
 - yourBPM: framework for dynamic service composition
 - ARTIST: model-based framework supporting the re-architecture of legacy systems
 - SUPERSEDE: Runtime Dynamic Adaptation Enactment (DAPPLE)
 - STAMP Amplification Tooling (Unit Test, Configuration Test, Runtime Test)
- ELATEST Platform



Jesús Gorroñoitia

Strategic Projects

CIPSEC



Web	www.cipsec.eu
Budget	7,017,235 €
Funding	5,258,316 €
Date	May 2016 to Apr 2019
Coordinator	Atos
Contact	rodrigo.diaz@atos.net

Challenges

In recent years, the majority of the world's Critical Infrastructures (CIs) evolved to become more flexible, cost efficient and able to offer better services and conditions for business opportunities. Towards this evolution, CIs and companies offering CI services had to adopt many of the recent advances of the Information and Communication Technologies (ICT) field. This adaptation, however, was rather hasty and without thorough evaluation of its impact on security. The result was to leave CIs vulnerable to a new set of threats and attacks that impose high levels of risk to the public safety, economy and welfare of the population.

In so far, the main approach to protect CIs is to handle them as comprehensive entities and offer them a complete solution for their overall infrastructures and systems (IT&OT departments). However complete CI protection solutions exist in the form of products from individual companies.

Value Proposition

The main aim of CIPSEC is to create a unified security framework that orchestrates state-of-the-art heterogeneous security products to offer high levels of protection in IT (information technology) and OT (operational technology) departments of CIs. As part of this framework CIPSEC will offer a complete security ecosystem of additional services that can support the proposed technical solutions to work reliably and at professional quality. These services include vulnerability tests and recommendations, key personnel training courses, public-private partnerships (PPPs) forensics analysis, standardization and protection against cascading effects.

All solutions and services will be validated in three pilots performed in three different CI environments (transportation, health, environment). CIPSEC will also develop a marketing strategy for optimal positioning of its solutions in the CI security market.

Business Impact

- CIPSEC will provide a Unified security framework for Critical Infrastructures by allowing easy integration of heterogeneous systems to its framework with reduced adjustment, notably anomaly detection, anti-malware, cyber-security detection and prevention, distributed denial of service, and hardware security platforms. CIPSEC will collect and process input from multiple sources and will provide monitoring for the complete Critical Infrastructure.
- CIPSEC will offer a complete set of additional services to reliably support the proposed technical solutions at a professional demanding level, among which industrial control system vulnerability tests, studies for cascade effect attacks, contingency plans, and innovative forensics analysis are included. Training courses and certification will also be provided.
- Through the identification of a requirements baseline for security and resilience within pilots, CIPSEC will be endorsed under true conditions and real infrastructures. CIPSEC will supply an overall solution, suitable for transportation, health and environment sectors both at module level (for each industry and security facet) and at system level (the complete framework).



Web	www.ditas-project.eu
Budget	4,890,066.25 €
Funding	4,420,187.50 €
Date	Jan 2017 to Dec 2019
Coordinator	Atos Spain
Contact	clara.pezuela@atos.net

Challenges

Current applications are eager to acquire and consume more and more amounts of data coming from distributed heterogeneous devices and sources, specially from IoT and mobile applications. For a developer there is a need to deal with data in an effective, fast, agile, and secure manner. The truth is that edge nodes, only in combination with cloud services, can provide the benefits of both worlds: better bandwidth, latency and security; and reliability and scalability levels required by such Data-Intensive Applications (DIAs).

Value Proposition

DITAS value proposition is based on the following objectives:

1. Improvement of productivity when developing and deploying data-intensive applications.
2. Enhancing the data management in mixed cloud/fog environments adding data and computation movement.
3. Definition of strategies for improving the execution of data-intensive applications.
4. Enabling the execution of data-intensive applications in a mixed cloud/fog environment.
5. Maximizing the impact on the market of developers and adopters of data-intensive applications.

Outcomes

DITAS Cloud Platform allows developers to design data-intensive applications, deploy them on a mixed cloud/edge environment and execute the resulting distributed application in an optimal way by exploiting the data and computation movement strategies, no matter the number of different devices, their type and the heterogeneity of runtime environments. It brings the developer's toolbox the best of Cloud & Edge worlds.

The platform provides two main tools: DITAS SDK which supports design and deployment, and DITAS Execution Environment, which is responsible for running and controlling the behavior of the application.

Business Impact

The goal of DITAS is to propose a framework, composed by a SDK and an execution environment, which aims to overcome the barriers that now hamper the adoption of Cloud Computing and increase the adoption of Fog computing by exploiting the full potential of these two paradigms in a synergic way. This will support the development and execution of data-intensive application that are now - and even more in the future - crucial for organizations and companies that want to manage their data in an efficient, reliable, scalable, and secure manner. Abstractions provided in DITAS with Data Virtualization and Data Utility will expose the data to be managed by the application in terms of Virtual Data Containers which hide the complexity of the underlying infrastructure composed of heterogeneous data sources, smart devices, traditional servers, and sensor networks. Atos is the Project Coordinator and actively involved in the Scientific and Technical Coordination due to its extensive experience managing large projects. Atos also contributes actively to almost all the technical activities. Additionally, Atos leads the market analysis, exploitation planning, the IPR management, and is Impact and Dissemination leader.



Web	www.eo4wildlife.eu
Budget	2,665,325 €
Funding	2,665,325 €
Date	Jan 2016 to Dec 2018
Coordinator	Atos Spain
Contact	jose.lorenzo@atos.net

Challenges

Scientists are able to use Copernicus datasets for different purposes with the objective of identifying the key environmental factors that play a major role on the distributions of animals through the world. Additionally, predictive models definitively can help with the goal of providing tools for better decision-making about animal protection. But none of those can be studied separately without taking into account various climate change scenarios to determine population distributions and understand how those changes may affect phenology and demographic processes.

Exploiting the rich datasets necessary to get useful and relevant information is a challenge for scientists, since a broad diversity of systems, platforms and interfaces are available in the market which makes overwhelming accessing those sources to download and analyze the data. EO4wildlife provides a quick and easy access to a comprehensive set of EO datasets, as well as a toolbox of services for data filtering, processing and visualization.

Value Proposition

EO4wildlife main objective is to bring large communities of multidisciplinary research scientists such as biologists, ecologists and ornithologists around the world to collaborate closely together while using the European Sentinel Copernicus Earth Observation more extensively and efficiently. EO4wildlife research specializes in the big data intelligent management, processing, fusion and advanced analytics with a Knowledge Base for wildlife migratory behavior trends. The research will lead to the development of web-enabled open services using OGC standards for sensor observation and measurements and data processing of heterogeneous geospatial observation data and uncertainties.

Outcomes

An open service platform with an interoperable toolbox will be designed and implemented. The platform will offer high level big data services that can be accessed by scientists to perform their respective research on species behavior related to environmental conditions and change of those conditions under certain threats. Also, the platform front end will be intuitive to use and access by scientists. It will reduce barriers to accessing dedicated big data services for processing geospatial environmental simulations using Sentinel Earth Observation data which are intelligently fused with in-situ observations data from other sources.

The Application Layer design will be driven by different scenarios which represent the technical solutions to implement in order to address various problematic issues for the end users of the project. In this sense, the platform will provide: seabird distributions predictions; better knowledge of pelagic fish's migrations routes and habitat use; marine mammal assessment on habitat preferences to inform conservation and management; and support to identify marine turtle behaviors.

Business Impact

Space technologies have the potential to transform scientific project back on Earth. As a member of the European Commissions' EO4wildlife project, Atos is designing and developing a platform that will enable scientists around the world to analyze wildlife movements using the Sentinel satellites' observation data of the European Union's Copernicus program to support projects to study the habitat of various migrating animals. These earth observation satellites are generating unprecedented volumes of data. To maximize the value of these terabytes of information, the scientific and research community needs to be able to integrate this data into their studies.



Web	www.heartman-project.eu
Budget	3,325,050 €
Funding	3,325,050 €
Date	Jan 2016 to Dec 2019
Coordinator	Jožef Stefan Institute (Coordinator) Atos (Technical Coordinator)
Contact	carlos.cavero@atos.net

Challenges

HeartMan is a personal health system to help congestive heart failure patients manage their disease. Its decision support system provides personalized advice. It features advanced devices and monitoring methods to understand the patients' physical and psychological state, and standard-based data management for wide interoperability.

1%-2% of people in the developed world suffer from congestive heart failure (CHF), which costs the society around 100 billion USD per year. While the improvements in treatment have lately decreased the number of hospitalizations and deaths due to CHF, they remain high: around half the patients with CHF are expected to die within five years, and CHF is the most frequent cause of hospitalization in people aged over 65. There is currently no cure available, which makes better management of CHF of paramount importance: both to improve the patients' quality of life and to reduce the economic costs to the society.

Value Proposition

In the HeartMan project we developed a personal health system for CHF that features a DSS based on predictive computer models. The user - a CHF patient - is monitored with the sensors in his/her smartphone, health devices that may be wearable (e.g. ECG monitor), used occasionally (e.g. scales) or placed in the apartment (e.g. temperature and humidity sensor). The devices are connected to a mobile phone through a framework capable of intelligently managing a wide range of devices and ensuring the right devices are sampled with the right frequency at the right time. The framework also interprets the sensor data to extract parameters describing the patient's physical and psychological state. These parameters together with the user's feedback entered through a mobile application are fed into a DSS.

The DSS first uses predictive computer models for CHF and other decision models to suggest the appropriate intervention for the patient in his/her current state. Next, the patient's psychological profile and state is used to select the most appropriate presentation of the intervention, as well as select psychological interventions aiming to increase the receptiveness to medical advice and help cope with the disease. The interventions are finally presented to the user through the mobile application. The data generated by the system is stored in the cloud, taking into account privacy and security concerns. It is available to the treating physician through a web interface, and he/she is also able to modify the advice provided by the DSS if necessary. Anonymized data is available to medical researchers, who can be able to gain new insights into the CHF and its management

Business Impact

The HeartMan system achieves improved self-management of CHF by using a DSS based on predictive models intended for the patients. The HeartMan DSS is designed as a patient-oriented system, promoting self-care management in an individualized fashion. The users are educated and assisted in the monitoring procedures required by the system, and provided with personalized advice together with explanations appropriate for their understanding. As a result, they are closely involved in their disease management. From the available evidence, these features are expected to increase the level of patient participation.

The HeartMan system is a major step forward in the technology for self-management of CHF. It provides considerably more value to the patients than the current devices that only monitor the patients' physiological signals and at best provide basic interpretations.

The HeartMan system provides decision support through cognitive behavioral therapy using an approach based on cognitive dissonance and mindfulness exercises. From the available evidence, these features are expected to enhance the level of patient empowerment and self-control.



Web	www.integriddy.eu
Budget	1,584,028 €
Funding	1,232,901 €
Date	Jan 2017 to Dec 2020
Coordinator	Atos Spain
Contact	andrea.rossi@atos.net

Challenges

The InteGridy project aims at integrating cutting-edge technologies, solutions and mechanisms in a scalable Cross-Functional Platform of replicable solutions. This platform connects existing energy networks to diverse stakeholders, with enhanced observability of both generation and consumption profiles, facilitating the optimal and dynamic operation of the Distribution Grid, fostering the stability of the electricity grid and coordination of distributed energy resources, Virtual Power Plants and innovative collaborative storage schemes within a continuously increased share of renewable energy.

Value Proposition

- Integration of existing smart-metering/automation systems with IoT infrastructure enabling interoperability through standard APIs and efficient data collection and monitoring of grid assets.
- Novel modelling and profiling mechanisms allowing the creation of network topology and Demand Response models, together with battery cycling and charging profiles.
- Predictive algorithms enabling dynamic scenario-based simulation and multi-level forecasting for managing real-time demand and supply of energy and optimized decision making.
- Powerful and efficient visual analytics and end-user applications using novel human machine interaction techniques.
- A security access control framework, built upon the standardization regulatory environment for privacy and data protection.
- Innovative business models providing important tools to the energy market for dynamically involving Demand Response strategies and allowing new energy market entrants.

Outcomes

The overarching methodology of the project seeks to integrate tools, methods and technologies from computer science and electrical engineering with control engineering (automation and control of distributed storage sources) and chemical engineering (assessment of optimum behavior and cycling of batteries, heat storage and hydrogen-enabled systems). Such an interdisciplinary approach to addressing smart distribution grid, storage and system integration technologies with increasing share of RES is innovative and ground-breaking.

It will follow a pilot-driven approach as its overall goal concentrates on the fulfilment of actual need and requirements. A set of innovative methods/mechanism integration will be targeted by inteGRIDy activities that will result in exploitable products with a high commercialization potential.

Business Impact

The project will release an integrated platform of the enhanced version of already existing tools together with proper models and methodologies for smart cooperation between energy users and the Grid. These results will significantly contribute to the market of services that a new generation of energy users will be able to provide to the operators of the energy distribution networks.

The technological solutions the project will bring into the market will enable win-win cooperation among energy stakeholders in the frame of a continuously evolving regulatory framework that, even though with different speeds in different countries, is currently open new internal markets of energy and energy-related services.

These technological innovations introduced in the project will allow the involved SMEs to act as enablers for the application of innovative demand response schemes, ensuring the smooth and acceptable introduction of demand as a high-value actor in the energy markets.



Challenges

In February 2013, the European Commission published a survey on "ICT use in Education" that revealed several key-findings, which shaped the European view on the use of computing devices for learning. One of the key findings is the need for such solutions to enter learning environments in a more interactive way; not only in the lesson's preparation phase by the tutor as is the most common use nowadays, but also the need to have a more general ICT use that serves the educational process outside a dedicated learning venue (classroom, enterprise, etc.) as well. Moreover, in the special case of intellectually disabled children, the use of ICT has been extensively tested during the last decades and has now reached a level of maturity, where targeted solutions can be applied, going beyond the sphere of research and, thus, creating a new potential market.

MaTHiSiS will assist the educational process for learners and their tutors and caregivers by creating a novel and continuously adaptable "robot/machine/computer"-human interaction ecosystem to enhance vocational training, workplace learning and mainstream education for individuals with or without learning disabilities.

Business Impact

It will support learning across a variety of learning contexts and, with the use of a variety of devices (robots, interactive boards and mobile devices), with personalized and adaptable, time and location independent learning paths, being transferred between the agents, always taking into consideration best knowledge and practices learnt from the previous device.

By the end of the project, it will introduce a marketable innovation, aimed at the re-usability of educational and training content and fostering the interactivity between technology and learners/tutors/caregivers.

Value Proposition

One of the core objectives of the project is to enter the learning environments and make use of computing devices in learning in a more interactive way, which will provide a product-system to be used in formal, non-formal and informal education. An ecosystem for assisting learners/tutors/caregivers for both regular learners and learners with special needs will be introduced and validated in 5 use cases: Autism Spectrum Case, Profound and Multiple Learning Disabilities Case, Mainstream Education Case, Industrial Training Case and Career Guidance Distance Learning Case.

MaTHiSiS product-system consists of an integrated platform, along with a set of re-usable learning components (educational material, digital educational artifacts etc.), which will respond to the needs of a future educational framework, and provide capabilities for: i) adaptive learning, ii) automatic feedback, iii) automatic assessment of learner's progress and behavioral state, iv) affective learning and v) game-based learning.

Within MaTHiSiS an innovative structural tool of learning graphs is going to be introduced to guide the learner through the process of learning in the given scenario. To reach a learning objective, learner will have to "follow the path" of the learning graphs, built up on Smart Learning Atoms, which are a certain learning elements that carry defined learning materials.

To ensure barrier free integration in the market, MaTHiSiS will make use of a range of interaction devices, such as specialized robots, mobile devices and whiteboards. The consortium will ensure easy-to-use solution with e.g. specialized graphical editor-like tool, allowing to easily create educational materials as well as the reusability within both mainstream education and vocational training setups.

Web	www.mathisis-project.eu
Budget	7,621,085 €
Funding	6,531,895 €
Date	Nov 2016
Coordinator	Atos Spain
Contact	ana.pinuela@atos.net

Outcomes

It will provide a "product-system" consisting of an integrated multi-agent interactive platform, along with a set of reusable learning components (educational material, digital educational artifacts, etc.) that will guide the deployment of the users' learning activities. Its educational scheme will be based on custom-made and adaptable learning goals and educational material.

A Cloud-based Learner's Space (CLS) will be developed to provide storage and interaction system for adaptation/personalization in learning, profiles storage, interaction, data acquisition and analysis as well as content creation on the fly. This is a core component of the MaTHiSiS system which include 4 crucial subsystems that create an innovative smart learning ecosystem: i) the experience engine, a graph-based interactive storytelling engine, that generates interactive content that is later sent to a device of tutor's/learner's choice; ii) the learning graph engine, responsible for adaptation of the Learning Graph based on learner's behavior and interaction; iii) the Decision Support System (DSS) providing and collecting learning analytics and controlling synchronous and asynchronous interaction between devices; and iv) Profile Repository to store collected data and learning graphs for learners profile. To ensure constant educational flow and augmented learner engagement, the emotion recognition and context aware cognitive/behavioral status extraction tools are going to be introduced within the system addressed by the Sensorial component.

For the purpose of validating MaTHiSiS approaches in learning environment, a set of Smart Learning Atoms (SLA) is going to be created for defined use cases. Such SLAs will adapt to each learner in a different way based on her/his particular needs, cognitive affective state, relevance to specific learning requirements and previous performance. Further, an editor-like tool will be introduced to be able to transform educational material into SLAs. The learning graphs then are going to be deployed to interact with the CLS as well as a front-end tool for tutors and caregivers to enable creation, editing and authoring of the learning material.



Challenges

More than 90% of manufacturing companies in Europe are SMEs. When trying to adopt Industry 4.0 paradigm, there is a big challenge for SMEs to access new technologies, to acquire the right skills and to transfer their products to the market.

Value Proposition

MIDIH aims at producing a one-stop-shop for Manufacturing SMEs to provide them technological, business and skills building services.

This one-stop-shop will be focused on CPS/IoT and will cover the following three areas:

- Nine ICT-driven Competence Centres, each specialized in key facets of the CPS/IoT enabling technologies, to provide unique technology-business-skill building services (access to knowledge and competencies, access to technology and experiments, access to local market and finance) to SMEs.
- A cross-border network of three Lighthouse experiments in some of the most relevant manufacturing industrial sectors, emphasizing the free flow of data across borders and focusing on the aspects of standards, data security and privacy, also from a legal-policy viewpoint. We have identified an Automotive Industrial case in Italy, a Cutting Tools Industrial case in Spain and a Collaborative Manufacturing and Logistics Industrial case in Germany.
- An SME-oriented Access to Market sustainable program to overcome the current barriers preventing startups and SMEs to directly address the Manufacturing Industry market

Web	www.midiheu/ project.php
Budget	8,524,832.50 €
Funding	7,999,157.50 €
Date	Oct 2017
Coordinator	EIT Digital
Contact	jorge.rodriguez@atos.net

Outcomes

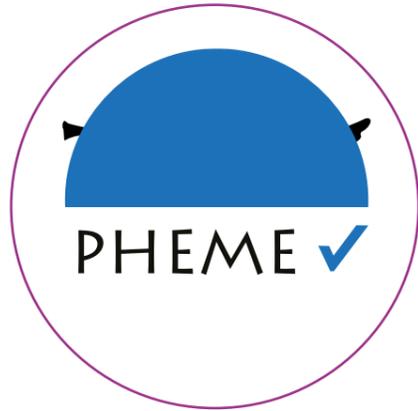
The main outcomes of the project will be:

- The MIDIH ecosystem of Competence Centers and DIHs: The MIDIH ecosystem is composed by the three existing pan-EU DIHs.
- The MIDIH Open Source Digital Platform: The MIDIH Open Platform extends the Open Source BEinCPPS Platform with new components and functionalities.
- The MIDIH Collaboration Platform for pan-EU and Regional DIHs: A DIH is a network of Competence Centers behaving as a one-stop-shop for SMEs to access technology, knowledge and market.

Business Impact

The main impact of the project is to provide the network of DIHs and CCs with new technological and business services in areas not previously covered, such as real time data analytics, edge fog computing and data sovereignty among others, extend the network in Eastern Europe to leverage of the growing manufacturing industry in that area, reinforce the connection between the network's nodes to improve partnership across Europe and allow advanced experiment and sustain the ecosystem in the long term through an efficient mechanism of finance based on the provision of added values skills and services as well as collaboration with local initiatives. Thus, MIDIH will make a fundamental step in ensuring that any company, anywhere in Europe, even far from traditional business centres is empowered with the technical, financial, business development and market access tools, skills and resources to develop innovative and valuable CPS-IoT products and services.

The main final outcome is to improve EU competitiveness through the development of a knowledge intensive data-driven SME ecosystem with higher value services and increased productivity.



Web	www.pHEME.eu
Budget	4,269,938 €
Funding	2,916,000 €
Date	Jan 2014 to Mar 2017
Coordinator	University of Sheffield
Contact	tomas.parietelobo@atos.net

Challenges

Social media poses three major computational challenges, dubbed by Gartner the 3Vs of big data: volume, velocity, and variety. Content analytics methods have faced additional difficulties, arising from the short, noisy, and strongly contextualized nature of social media. In order to address the 3Vs of social media, new language technologies have emerged, e.g. using locality sensitive hashing to detect breaking news stories from media streams (volume), predicting stock market movements from microblog sentiment (velocity), and recommending blogs and news articles based on user content (variety).

PHEME focused on a fourth crucial, but hitherto largely unstudied, challenge: veracity. It has modelled, identified and verified phemes (internet memes with added truthfulness or deception), as they spread across media, languages, and social networks.

Value Proposition

PHEME achieved this by developing novel cross-disciplinary social semantic methods, combining document semantics, a priori large-scale world knowledge (e.g. »»» Open Data) and a posteriori knowledge and context from social networks, cross-media »»» and spatio-temporal metadata. Key novel contributions are dealing with multiple truths, reasoning about rumor and the temporal validity of facts, and building longitudinal models of users, influence, and trust.

Outcomes

In particular, PHEME delivers a veracity framework able to track rumors over time, providing a set of state-of-the-art components and algorithms for social media veracity and fact checking. Results have been validated in two high-profile case studies: healthcare and digital journalism.

Business Impact

The techniques developed in PHEME were generic with many business applications, e.g. brand and reputation management, customer relationship management, semantic search and knowledge management. In addition to its high commercial relevance, PHEME also benefits society and citizens by enabling government organizations to keep track of and react to rumors spreading online. Of especial interest is the potential impact for detection and veracity checking of news for journalists. This has already attracted attention of journalists around the globe, and the proof is that the project is now known by the media informally as the "Twitter lie detector".



Web	sonata-nfveu
Budget	8,256,066 €
Funding	6,657,721 €
Date	Jul 2015 to Dec 2017
Coordinator	Atos Spain
Contact	josep.martrat@atos.net

Challenges

Software Defined Networking (SDN) and Network Functions Virtualization (NFV) are emerging as major transformational technologies towards "software networks", a new paradigm that is evolving the telecom sector with new network capabilities and business opportunities.

SONATA addresses the significant challenges associated with both the development and deployment of the complex services envisioned for 5G networks and empowered by these technologies. The project is developing a NFV framework that provides a programming model and development toolchain for virtualized services, fully integrated with a DevOps-enabled service platform and an orchestration system.

Value Proposition

SONATA primary value proposition is to enable and ensure delivery on the promised NFV core business case. The new challenges introduced by the NFV transition require a MANO solution, as well as enablers of service agility on the development side.

Furthermore, SONATA has two unique key advantages that differentiate it from the competition. These two key advantages are the core values of SONATA value proposition:

- Flexibility and Openness.
- Holistic Inter-Organizational Approach with SDK (Software Development Kit) and DevOps.

On the one hand, SONATA 's open and flexible architecture can help to alleviate NFV adopters ' initial pain points revolving around multi-vendor complexity. On the other hand, SONATA 's agile service development and DevOps methodology can help to empower CSPs and supporting third-party developers with the workflow and tools needed for the agile service development and deployment envisioned for 5G networks.

Outcomes

SONATA initial results include:

- SONATA's Network Service SDK: Facilitates network service development for third-party developers
- SONATA's Service platform: Thanks to the modular design of its MANO framework, the platform offers high customization opportunities for both, Communication Service Providers and Service Developers.
- SONATA NFV DevOps Workflow: The SONATA system is designed for agile development and operation of network services. It enables a DevOps workflow between the SDK tools and the service platform, which allows developers and operators to closely collaborate.

Business Impact

Reduce time-to-market of networked services. The contribution towards reducing time to market for services based on NFV adoption and extension is two-fold. On the one hand, offering a well-structured Service Development Kit (SDK) will allow service developers to easily develop and deploy networked services on top of telecom operators' resources, while, on the other hand, promoting DevOps model to seamlessly integrate service development and management operations of virtual network functions. Optimize resources and reduce costs of service deployment and operation, developing uniform multi-vendor service orchestration functions that fully exploit available resources to efficiently fulfill service requirements. This also extends to non-trivial services, for example, services that maintain state inside their individual functions or that map specific users to specific functions. This is supported both at deployment time for initial configuration of a single service as well as during operation time when the mapping of multiple competing services to resources is re-configured. Accelerate industry adoption of software networks. Driven by the excellence and complementarity of its consortium, perfectly balanced in terms of company types, technical expertise and roles in the value chain, SONATA achieves this not only by technical results, e.g. the integration of SONATA SDK with service orchestrator, but also via the definition of a roadmap highlighting business opportunities arising from the adoption of extended NFV technologies proposed by SONATA.



Challenges

Analyzing the market, we have found the importance of exploiting parallelism is of increasing significance, as parallelization has become a dominant method of delivering higher performance and improved energy efficiency.

In this context, some of the biggest challenges to future application performance are:

- Future application performance lie with not only efficient node-level execution but power consumption as well.
- Developers need to fully understand, and use an approach that abstracts, the nuances of different hardware configurations and software systems (both rapidly evolving).
- Developers need ways to address additional difficulties in performance, security mixed-criticality and power consumption resulting from the heterogeneous system.
- An important step in software design for low power is that software must correctly fit to the capabilities of the underlying (and heterogeneous) hardware.

Value Proposition

Simplify & Optimize Heterogeneity: Simplifying the way programmers approach the development of next generation applications.

TANGO tools help control and abstract underlying heterogeneous hardware architectures, configurations and software systems including heterogeneous clusters, chips and programmable logic devices while providing tools to optimize various dimensions of software design and operations (energy efficiency, performance, data movement and location, cost, time-criticality, security, dependability on target architectures).

Outcomes

The results will be packaged and released in TANGO Toolbox as Open Source. The toolbox will include:

- A toolbox based implementation of the reference architecture
- Reference software development models and methodologies for best practice
- A collection of reusable IDE plugins, programming models and runtimes
- An adaptive quality model for holistic system performance
- Automatic code generation including software and hardware energy modeling.

Web	www.tango-project.eu
Budget	3,199,625 €
Funding	3,199,625 €
Date	Jan 2016 to Dec 2018
Coordinator	Atos Spain
Contact	clara.pezuela@atos.net

Business Impact

TANGO will impact on both the IT industry and the market. It will also impact on the research community advancing future application development processes to a new stage in which the development process for parallel architectures will be simplified, abstracted from underlying architectures and hardware, and will enable tools to consider optimized control and self-adaptation.

Besides the release of the technologies under an Open Source approach, TANGO considers the foundation of a research alliance -TANGO Heterogeneous Hardware Alliance (HHW Alliance), in which it will seek complementary efforts of other research projects, initiatives and IT community organizations to nurture a strong research collaboration, integration and effective promotion of the results and continue evolving the work done during the project to become a relevant influencer in the developing HHW market.

More concretely, we identify potential in the following contexts

- Abstracting hardware heterogeneity to help create & operate next-gen apps
- Embracing new hardware in the Data Center extending HPC workloads
- Code taking control of Performance vs Energy Awareness



Challenges

The advent of outsourced and distributed processing environments like cloud prompts fundamental transformations in whole ICT ecosystems, while bringing new opportunities to stakeholders in the availability and rational use of physical resources with large-scale savings in IT investments. Conversely, it also poses new security challenges especially for ensuring robust protection of privacy and integrity of personal information, which are a fundamental part of the societal acceptance of new ICT schemes, services and solutions.

In this context, the WITDOM project focuses on developing innovative solutions for truly efficient and practical privacy enhancing techniques and efficient signal and data processing in the encrypted domain for the increasingly demanded outsourced environments. The project pursues to produce a framework for end-to-end protection of data in untrusted and fast evolving ICT-based environments, with focus in data-outsourcing scenarios, new threats, vulnerabilities and risks, which require end-to-end security solutions that will withstand progress for the lifetime of applications they support.

Value Proposition

WITDOM aims at producing a novel framework for a quantitative evaluation of end-to-end security and privacy, to guarantee an efficient and verifiable provision of privacy in the context of ICT services owned by third-party providers of distributed processing and storage, thereby maximizing independence from stated security and privacy commitments by respective providers, and minimizing the current need of blind trust from the clients, solely based on written consents.

This framework shall use security-and-privacy-by-design methodologies, and advance the state of the art in effective protection of personal & sensitive data in the following areas:

- Privacy enhancing techniques, perturbation mechanisms and privacy metrics
- Cryptographic privacy techniques supporting encrypted processing
- Cryptographic techniques for integrity and verifiability of outsourced processes
- European legal landscape

Outcomes

WITDOM delivers the following products according to three different levels:

- General Level: The WITDOM framework, aligned with concurrent projects and advancing the SoTA, and the WITDOM E2E framework acknowledges the following aspects:
 - Driven by Privacy by Design principles, holistic, E2E privacy / security time-resistant, efficient solutions & guarantees.
 - Methods to quantify information leaked to achieve sufficient & adequate privacy levels.
 - New trustworthiness-enhanced business models for exploitation, leading to reduce the need for trust in third parties.
- Practical Level: WITDOM platform based on a global SOA architecture.
- Implementation Level: toolkit and prototypes for the project scenarios, aiming at achieving a technology readiness level (TRL) 4-5.

Web	www.witdom.eu
Budget	4,020,281 €
Funding	2,764,031 €
Date	Jan 2015 to Dec 2017
Coordinator	Atos Spain
Contact	elsa.prieto@atos.net

Business Impact

WITDOM's innovations deals with the instantiation of the developed framework, platform and tools in two carefully chosen use-case scenarios, whose impact and sensitivity of the involved data make privacy a must, and where privacy and confidentiality constraints are a true barrier for profiting from the benefits of outsourced architectures and Cloud-based deployments.

The first use-case scenario is a health scenario based on outsourcing genetic data processes and workflows for large research analyses and individual clinical analyses. Genetic data is extremely sensitive, and genomic privacy has become a hot topic for research and innovation, to which WITDOM contributes by focusing on solutions for outsourced processing of genetic data dealing with secure sequence alignment and secure annotation, also providing end-users with secure outsourced backup functionalities with integrity and consistency guarantees.

The second scenario deals with outsourced financial analyses both customers' data and finance data, to enable risk calculations, fraud detection and forecasting operations deployed.

A key aspect of WITDOM innovations is built upon a legal assessment and validation of the recently reformed (May 2016) European Data Protection Regulation, »»»ing legal and ethical requirements with technological means to guarantee their enforcement.

Commercial Offers



Capturean



Capture & analytics

surfacing social intelligence

Description

In recent years the Web has become not only a place to consume and search for content, but an active environment where people and organizations create content and exchange data and knowledge. User-generated content, especially coming from social networks (SN), blogs or forums, is of a highly dynamic nature. The amount of content available even for specific topics is mind boggling. There is a clear need of tracking, filtering and analyzing this content in an automatic way in order to make sense of it and enable different usages of the data.

Capturean implements advance data collection and information integration technologies to gather and harmonize data from multiple sources into a single coherent representation. The acquired data is then analysed providing insights and metrics coming from social media. These metrics provide a view of what is going on the web that can serve as an input for multiple applications and business scenarios, such as brand management, product placement, media tracking, financial sentiment over time, reputation on the web, political debates, etc.

This asset is developed by a team led by [Tomas Pariente Lobo](#), Head of Lab

Business Challenge

In the age of Internet, business decisions are increasingly dependent on the just-in-time delivery of relevant information and knowledge. While in the past this information used to be structured, in today's world there is increasing dependence on unstructured sources of information, such as the Internet, and subjective inputs, such as sentiments, assessments, opinions, rumors, beliefs, etc.

Internet texts such as weblog articles and forums provide, for example, a massive amount of potentially useful information. An analyst or decision maker would have to collect, filter, assess, and interpret all these texts with respect to a current object of interest. However, accomplishing this task cannot be done manually due to time constraints in decision making and the enormous amount of documents.

Customers and R&D projects are asking for versatile tools that allow the acquisition of intelligence from Social Networks and apply it to the decision making process.

Capture offers a solution open, innovative and adaptable to the needs of costumers and organizations to gather and extract facts and intelligence from Social Networks.



Solution

Capturean provides automated methods for knowledge and intelligence processing and management, from data acquisition all the way to the final application services that include decision support, visualization, etc.

This application layer can be developed in a fast and cost-effective way thanks to previous implementations of Capture and the reuse of previously developed services for a broad range of sectors and applications, such as reputational risk in finance, rumor detection, security in smart cities, etc.

Capture is based on state-of-the-art big data technologies. The solutions uses Open Source frameworks and tools ranging from Apache Hadoop and Storm for distributed processing, to Apache HBase and Solr for storage and information retrieval. Capture extracts data from SN and RSS feeds using open APIs and tools delivering a set of metrics for specific scenarios.

Capture resembles the water cycle:

- by drinking from **Data Sources** (Twitter, RSS...), each delimited by queries to a Social Network;
- feeding **Data Channels**, or data flows related to several sources, usually about related topics;
- stored in thematic **Data Pools**, or functional topic-based repositories of annotated data;
- accessible via **Solr** queries;
- and processable in the **cloud** as-a-service using big data technologies.

Benefits

Capturean is an Atos offering in Social Network analytics, providing several APIs and integration points in order to ease the process of delivering data and insights to people or external applications.

Capturean provides an innovative dashboard with advanced reporting tools leaving the insights at the fingerprints of the users.



An European open ecosystem to develop smart applications

Do you know how Atos can help you setting smart services based on FIWARE?

Are you looking for opportunities to combine the Internet of Things with information and Big Data services on the Cloud? The FIWARE ecosystem can offer end-to-end solutions, as it provides enabling technologies and an open source standard platform that facilitates the development of smart applications.

Atos, a leading digital services company and one of the founders of the initiative, has acquired deep knowledge of the FIWARE technologies and ecosystem. Atos is therefore a reliable provider of commercial services around FIWARE.

Setting a FIWARE instance

A full FIWARE instance is the first thing our customers ask for when it comes to develop and deploy FIWARE based applications. An instance consists of a replication of FIWARE components and sufficient capacity quote to deploy FIWARE technologies. Based on our experience in operating one of the nodes of the FIWARE Lab - the experimental and federated cloud environment where to test and try FIWARE technologies - and thanks to Atos large expertise in managing dedicated infrastructures for multiple customers providing a professional service on infrastructure operation, we have designed a service that is adaptable to customers' needs.

There are two options:

1. Resources consumed ad hoc, on an hourly/daily basis
2. A yearly arrangement, with reduced prices for ad hoc resources

Option 2 allows making significant savings compared to option 1 but is bound to one year commitment.

“ The key to a successful implementation of a FIWARE solution:

Atos is Platinum member of the FIWARE Foundation. The FIWARE Foundation is the legal independent body providing shared resources to help to achieve the FIWARE Mission by Empowering, Promoting, Augmenting, Protecting, and Validating FIWARE technologies and the Community around them, including users, developers and the entire ecosystem.

Included in the service	Excluded from the service *
Infrastructure <ul style="list-style-type: none"> ▶ Data Center facilities ▶ Hardware servers & enclosures, HW maintenance, server management ▶ Hardware storage, backup & enclosures Connectivity <ul style="list-style-type: none"> ▶ Network, rack capacity ▶ Firewalls and VLANs ▶ GEANT connectivity for customer management access ▶ Access GEANT for virtual machines (public IP address) ▶ Internet access Service management <ul style="list-style-type: none"> ▶ Self-management via portal and/or API ▶ Standard service reporting ▶ Virus outbreak management ▶ Service and security management Support <ul style="list-style-type: none"> ▶ Service desk for Super Users and Admin users only 	Infrastructure <ul style="list-style-type: none"> ▶ End user hardware Connectivity <ul style="list-style-type: none"> ▶ Network connection customer to our premises (WAN) Management <ul style="list-style-type: none"> ▶ Technical and functional application management of the applications running on top of the provided platform ▶ Management of operating systems (configure, patch, change management) Other <ul style="list-style-type: none"> ▶ Customer changes, customized SSRs, projects ▶ Backup and Disaster Recovery ▶ Services on secondment or project basis, like technical consultancy ▶ Service level for Operating Systems or applications

*Available for purchase separately

End-to-end integration service allowing the connection of the sensors/devices layer to our customers' existing systems and applications.

According to analysts in 2015, Atos is positioned as one of the main players in IoT. Atos has experience in numerous vertical applications of IoT technologies and this is backed with a significant amount of commercial references. Understanding the business of our customer is crucial to provide the best IoT solution to a specific problem and context.

Atos has started to introduce FIWARE as underlying technology for Smart Cities. Actually, Atos is deploying FIWARE in two different pilots, one with the city of Málaga (Spain), where a mobility app improves city transport for citizens and the other one in Eindhoven (Netherlands) about smart lighting for traffic management. In both cases, Atos is integrating FIWARE with existing systems, sensors and specific city services.

IoT solutions based on FIWARE

Beyond the use of FIWARE in Smart Cities, and taking advantage of Atos expertise in IoT technologies, Atos offers also vertical applications based on FIWARE for different domains, such as Industry 4.0 or Agrifood (see [Atos IoT solution for trash management](#)). FIWARE is a suitable technology to pilot IoT solutions in manufacturing, construction, logistics, or utilities large companies. The proven integration of FIWARE with existing commercial tools leverages the value of FIWARE for many other sectors, bringing interoperability and modularity at a competitive price.

Coaching and training services

Although the specifications of FIWARE APIs are public and royalty-free, and an open source reference implementation of each of the FIWARE components is publicly available, it is sometimes challenging to start developing FIWARE applications. To help our customers overcome the initial learning curve, Atos offers ad-hoc coaching and training services. Atos extended experience in developing FIWARE applications is extremely valuable when delivering practical training about the platform. It is particularly suited to present the overall initiative to IT companies interested in developing their own FIWARE applications or to Atos partners developing joint solutions.



Do you need to catch up with innovation?

We are here to help you!...

Based on its day-to-day activity, the Atos Research & Innovation team (ARI) has developed **efficient working processes, methodologies, knowledge and collaborative tools that can be expanded for the benefit of customers.**

From strategy to project management, from the generation of ideas to the identification of funding opportunities and selection of the right partners, from opportunities to results, our extensive experience enables us to provide reliable Research, Development and Innovation (RDI) support and consulting services.

The challenge is to improve the competitiveness of companies and / or public bodies through the integration of research, development and innovation activities in their operations. Research and innovation public programs support organizations in carrying out innovative projects.

However, not all organisations have the expertise or the abilities to manage this support properly. Furthermore, to remain competitive, businesses need to internationalize their knowledge or technology, entering projects that cannot be performed individually, but in cooperation with partners all over Europe and beyond.

We offer support services that cover the whole cycle, from identification of funding sources and programs, to proposal preparation, including the establishment of partnerships.

Support services also include contract negotiation, as well as the following administrative / financial management and technical coordination of funded projects.

Additional services are related to the innovation process and consider emerging technologies watch, ideas generation, innovation management, etc.

All those activities are supported by state-of-the-art methodologies and IT tools in order to offer efficient and skillful support.

The benefits for our customers are increased possibilities to start and undertake research and innovation activities. It also allows them to network and cooperate with key players in RDI (e.g. research institutes, universities, companies, etc.), which is an added value in view of the creation of partnerships, alliances and internationalization. Benefits can be summarized as follows:

- Be at the cutting edge of innovation.
- Access to and participation in R&D programs.
- Work in collaboration with organizations all over Europe.
- Gain competitiveness.

Document: [Idea Generation Workshops](#)





CityGO

Powered by FIWARE

Description

Atos provides an innovative, easy and customizable solution to any city, conformed by two complementary tools:

- **CityGO:** Mobile application, which indicates to the user what public transport options are available at any time for a particular route. For instance, it suggests options such as electric car sharing, buses, the nearest public bike rental station, available parking spaces, etc. Everything is managed in real time to obtain an optimal route based on data provided by the sensor network and open data from the city.
- **CityDash:** Web-based dashboard for the city municipality control center, which allows civil servants to visualize all the data coming from the city sensors network to support everyday decision making and evidence-informed analysis to improve the traffic planning in the city in times of high tourist's flows, sport events, among others.

Solution

The key features of CityGO can be summarized as: Based on the user profile (GPS position, usual routes, preferences), it adapts the routes to each user taking into account daily routines to provide personalized recommendations, providing information about buses lines and stops, status of traffic and queues, bus schedules, car sharing, bicycle renting, and others, all in real-time.

Additionally, the key features of CityDash are: Dashboard that enables the visualization of real-time information, time-series indicator data and interactive maps about all aspects of the city, including: city traffic flow, people movements, cars, bus fleets, location of citizens connected to the Mobile App, video map showing citizens movements the previous day, and others.

Benefits

The benefits of CityGo, and complementary of CityDash are relevant for citizens, local authorities and public transport operators. Low-cost development and deployment of customized urban mobility CityGOapp (not limited to multi-modal journey planner) is the main enabler for passenger data analysis.

Benefits for the user are related to the recommendations on what's the best itinerary to take and what's the best means of transport based on the real-time information in a proactive way, so the user doesn't have to express his exact itinerary everytime.

For the city, the app presents real advantages as it gives information on users' regular itineraries that allows better planning of routes (streets usage and possible adjustments, traffic lights, etc). CityGO gives information on bus routes, lines information and also what the user does before and after taking a given bus. Also, the bicycle information systems provide information on users and how many parking spaces available are needed.

Business Challenge

Today 54% of the world population lives in cities, and by 2050 this figure is estimated to reach 66%. If we want to reduce pollution, mitigate climate change, and contribute to have cities of the future smarter and more livable for everyone, we must tend towards the use of public transportation. Moreover, efficient urban mobility goes far further than multi-modal journey planning. Local authorities also need to focus on traffic flow optimization and environmental issues. Considering this scenario, Atos has developed **CityGO**, a mobile application for users to plan their city itineraries according to their preferences and usual habits, complemented with a web application for the municipality of the cities called **CityDash**.



Your health at your fingertips

Description

Every sector is gaining awareness of the importance of Digital Transformation these days, and is eventually unleashing the power that IT implementation can give in terms of benefits, efficiency, and experience, among others. The Health sector in Europe has been conscious of this situation, at the point that 70% of Member States have a national e-health policy or strategy, according to the World Health Organization. Within this context, Atos Research & Innovation (ARI) has developed **Pocket mHealth**, a patient-centered solution, which enables patient empowerment in the management of his/her own medical information. In particular, it allows storing and retrieving their Electronic Health Record (EHR), as well as health data coming from different Hospital Information Systems (HIS).

Solution

Pocket mHealth is composed of a patient oriented smartphone application and a set of desktop applications installed at healthcare stakeholders systems with access to the HIS using connectors. The mobile application allows carrying, accessing and transferring the personal medical information in the form of a standardized Electronic Health Record - making use of different healthcare standards like openEHR/EN13606 and HL7 FHIR, and well-known terminologies such as SNOMED-CT. The tools installed at the hospitals allow accessing the HIS using configured templates, normalizing the clinical data and transferring the record to the smartphone using Bluetooth. The mobile application can bring together the clinical information coming from different HIS and it is totally transparent to patients. The solution provides not only the benefits of a connected practice or organization such as clinical efficacy improvement, healthcare cost savings and increase of overall care quality, but also supports the care transformation that is enabled by a patient centered design.

Benefits

The potential benefits that might be achieved by the analysis of the information generated by the patient throughout its complete care process between different healthcare stakeholders are the following:

- Acceleration of clinical research
- More accessible and better developed measures of clinical performance
- Increased public health monitoring and disease management
- New care delivery models
- Patient self-management
- Better care coordination across settings
- New data that supports decision-making
- The clinical information complies with the "distributed interoperability" paradigm because the driver for the exchange of medical data is the patient

Business Challenge

Healthcare organizations are currently expected to adopt a position towards data openness that is aligned with a patient centered approach. However, they need to break down 'data silos' between them to be able to provide appropriate services to patients. Their challenge is to enable patients to become the driver of the change bringing standardized pieces of EHR in the mobile, what we call "distributed interoperability". Additionally, important saving on resources can be achieved by supporting a zero paper policy that delivers a better experience to the patient, with faster processes between different health facilities or experts.



Publications, Events & Prizes

Publications

Publication	ARI Author/s	Details
Real-time Probabilistic Data Fusion for Large-scale IoT Applications	Juan Sancho et al.	IEEE Access, vol. PP, no. 99, pp. 1-1. DOI: 10.1109/ACCESS.2018.2804623 >>>
LIGHTest Press Interview	Alberto Crespo	Revista Banca15 >>>
LIGHTest Radio & TV Interviews	Alicia García, Aljosa Pasic	Marca España RTVEGestiona Radio >>>
ARIES Radio Interviews	Pedro Soria, Elsa Prieto	Cope Noche, Empresa Exterior >>>
ABC4EU Radio Interviews	Javier Presa	Gestiona Radio, Intereconomía >>>
ARIES Reliable European Identity Ecosystem	Nicolás Notario, Alberto Crespo	ERCIM News 109 >>>
Orchestrating Privacy Enhancing Technologies and Services with BPM Tools. The WITDOM Data Protection Orchestrator.	Nicolás Notario, Alberto Crespo, Eduardo González	ARES '17 Proceedings of the 12th International Conference on Availability, Reliability and Security Article No. 89 >>>
Towards a Privacy-preserving Reliable European Identity Ecosystem	Nicolás Notario	Annual Privacy Forum 2017 Part of the Lecture Notes in Computer Science book series (LNCS, volume 10518) >>>
Assessment of a personalized and distributed patient guidance system	Ángel Palomares	International Journal of Medical Informatics Volume 101, May 2017, Pages 108-130 >>>
EPICA: Efficient and Privacy-respectful Interoperable Cloud-based Authorization	Beatriz Gallego-Nicasio Crespo, Javier García Robles	Implementation of an Access Control model for Multi-tenant Cloud Environments. EPICA: Efficient and Privacy-respectful Interoperable Cloud-based Authorization Beatriz Gallego-Nicasio Crespo, Javier García Robles March 2017, Submitted to SECRIPT 2017
An SDN-based Architecture for Security Provisioning in Fog-to-Cloud (F2C) Computing Systems	Rodrigo Diaz	Sarang Kahvazadeh, Vitor B. Souza, Xavi Masip-Bruin, Eva Marín-Tordera, Jordi Garcia, Rodrigo Diaz. An SDN-based Architecture for Security Provisioning in Fog-to-Cloud (F2C) Computing Systems. CIPSEC project. Presented to the Future Technologies Conference (FTC) 2017 to be held from 29-30 November 2017 in Vancouver, BC, Canada.
A Dynamic Monitoring Platform for IoT-based Cyber Physical Networks	Rubén Trapero	A Dynamic Monitoring Platform for IoT-based Cyber Physical Networks. In Proceedings of Third International Workshop on Security Testing And Monitoring, Diego Rivera, Antonio M. Ortiz, and Ruben Trapero. 2017. Reggio Calabria, Italy, August 29 - September 1, 2017 (STAM 2017)
ZONESEC: built-in cyber-security for wide area surveillance system	Aljosa Pasic, Jose-Ramon Martinez-Salio, Susana González Zarzosa, Rodrigo Diaz	ZONESEC: built-in cyber-security for wide area surveillance system. Aljosa Pasic, Jose-Ramon Martinez-Salio, Susana Gonzalez Zarzosa, Rodrigo Diaz. Reggio Calabria, Italy, August 29 - September 1, 2017 (ARES 2017)
Cloud technology options towards Free Flow of Data	Jose Francisco Ruiz, Nicolás Notario, Elsa Prieto	"Whitepaper: "Cloud technology options towards Free Flow of Data". June 2017. DPSP cluster."
Network Resilience in Virtualized Architectures	Beatriz Gallego-Nicasio Crespo	Network Resilience in Virtualized Architectures. IMCL'17- International Conference on Interactive Mobile Communication Technologies and Learning, 30-11-2017, Greece.
WISER Radio Interview	Aljosa Pasic	Radio interview about WISER project >>>
Press Release: Launch CyberWISER Essential and Plus.	Antonio Alvarez	>>>
Privacy Data Management and Awareness for Public Administrations: a Case Study from the Healthcare Domain	Jose Francisco Ruiz, Javier Garcia Robles	AFP2017 - ENISA Annual Privacy Forum 2017, 7 - 8 June 2017, Vienna
ANASTACIA Radio Interview	Alicia Garcia Medina	Interview (in spanish) to Alicia Garcia Media (Head of Atos Research and Innovation) in radio Marca España about the project ANASTACIA. >>>
ANASTACIA PRESS RELEASE	Ruben Trapero, Rodrigo Diaz	Press release about ANASTACIA project launch published on Atos corporate web page. >>>

Publication	ARI Author/s	Details
ARTIST: Model-Based Stairway to the Cloud	Jesús Gorroñoigoitia	Over the past decade, cloud services emerged as one of the most promising technologies in IT. Since cloud computing allows improving the quality of software and, at the same time, aims at reducing costs of operating software and hardware, more and more software is delivered as a service in the cloud. However, moving existing software applications to the cloud and making them behave as software as a service is still a major challenge. In fact, in addition to technical aspects, business aspects also need to be considered. The ARTIST EU project (FP7) proposes a comprehensive model-based modernization approach, covering both business and technical aspects, to cloudify already existing software. In particular, ARTIST employs MDE techniques to automate the reverse engineering and forward engineering phases in a way that modernized software truly benefits from targeted cloud environments. In this paper we describe the overall ARTIST approach and present several lessons learned.
Grammar based genetic programming for software configuration problem	Jesús Gorroñoigoitia	Software Product Lines (SPLs) capture commonalities and variability of product families, typically represented by means of feature models. The selection of a set of suitable features when a software product is configured is typically made by exploring the space of trade-offs along different attributes of interest, for instance cost and value. In this paper, we present an approach for optimal product configuration by exploiting feature models and grammar guided genetic programming. In particular, we propose a novel encoding of candidate solutions, based on grammar representation of feature models, which ensures that relations imposed in the feature model are respected by the candidate solutions.
ZONESEC: built-in cyber-security for wide area surveillance system	Aljosa Pasic, Jose-Ramon Martinez-Salio, Susana Gonzalez Zarzosa and Rodrigo Diaz	Paper named "ZONESEC: built-in cyber-security for wide area surveillance system" has been accepted for publication in S-CI 2017 Workshop, which will take place in conjunction with ARES 2017 to be held 29 august-1 September in Reggio Calabria, Italy. »»»
"Fully Differential High Input Power Handling Ultra-Wideband Low Noise Amplifier for MIMO Radar Application"	Aljosa Pasic, Jose-Ramon Martinez-Salio, Susana Gonzalez Zarzosa and Rodrigo Diaz	The paper named "Fully Differential High Input Power Handling Ultra-Wideband Low Noise Amplifier for MIMO Radar Application" is submitted to conference CSICS in Miami, from Oct 19-21 (https://csics.org/) »»»
A Fully Balanced Ultra-Wide Band Mixer MMIC with Multi-Tanh Triplet Input for High Dynamic Range Radar Receiver Systems	Aljosa Pasic, Jose-Ramon Martinez-Salio, Susana Gonzalez Zarzosa and Rodrigo Diaz	Technical university of Dresden published three papers: "A Fully Balanced Ultra-Wide Band Mixer MMIC with Multi-Tanh Triplet Input for High Dynamic Range Radar Receiver Systems" was accepted for ICNF conference in Vilnius, from June 20-23 (http://www.icnf2017.fvu.lt/) and another paper, named "A 6.5 to 15.1 GHz Ultra-Wideband SiGe LC VCO with 80 % Continuous Tuning Range" has been accepted for ECCTD 2017 in Catania, from Sept 4 to 6th (http://www.ecctd2017.dieie.unict.it/index.html) »»»
Large Scale Surveillance, Detection and Alerts Information Management System for Critical Infrastructure	Aljosa Pasic, Jose-Ramon Martinez-Salio, Susana Gonzalez Zarzosa and Rodrigo Diaz	University of Southampton IT Innovation Centre prepared paper named "Large Scale Surveillance, Detection and Alerts Information Management System for Critical Infrastructure". Paper will be presented at International Symposium of Environmental Software Systems (ISESS 2017 ; http://www.isess2017.org/) in Zadar, Croatia on May 10th -12th 2017. »»»
Frontiers in Spectral imaging and 3D Technologies for Geospatial Solutions	Aljosa Pasic, Jose-Ramon Martinez-Salio, Susana Gonzalez Zarzosa and Rodrigo Diaz	The Institute of Communications and Computer Systems (ICCS) of the School of Electrical and Computer Engineering (ECE) of the National Technical University of Athens (NTUA) has presented paper to conference ISPRS SPEC3D to be held in October 2017 in Jyväskylä / Finland. Paper is named "Frontiers in Spectral imaging and 3D Technologies for Geospatial Solutions" »»»
An integrated information lifecycle management framework for exploiting social network data to identify dynamic large crowd concentration events in smart cities applications	Juan Sancho et al	Future Generation Computer Systems, 2017Volume 78, Part 2 »»»
Adaptive Filtering as a Service for Smart City Applications	Elisa Herrmann, et al	Filtering, Smart cities, Tools, Monitoring, Intelligent sensors »»»
Privacy-Enhanced Tokens for Authorization in ACE (Updated v5)	Daniel Calvo et al	IETF 96 - BerlinJuly »»»
SHAR-Q: Interoperability and decentralization as axes of the future energy ecosystem	Juan Rico, Martin Wagner, Ugo Stecchi, Guadalupe Rodriguez	IV Smart Grids Congress, Madrid, Spain »»»

Publication	ARI Author/s	Details
Common and open APIs on all platforms	Martin Wagner, Guadalupe Rodriguez	IV Smart Grids Congress, November 2017 - Madrid, SpainPage 161 »»»
inteGRIDy - Enabling platform for the transformation of Smart Grids	Andrea Rossi, Javier Valiño, María Guadalupe Rodriguez	IV Smart Grids Congress, Noviembre 2017 Page 155 »»»
Cognitive hyperconnected digital transformation. Internet of things intelligence evolution	Javier Valiño et al	River PublishersISBN 978-87-93609-10-5Chapter 8: IoT European Large-Scale Pilots - Integration, Experimentation and Testing »»»
Drivers, Standards and Platforms for the IoT: Towards a digital VICINITY	Juan Rico et al	IEEE Intelligent Systems Conference 2017 - September 2017 - London UK »»»
Real time energy efficiency optimization in connected electrical vehicles	Juan Rico, Daniel Calvo, Juan Sancho, Miguel Rodriguez, Martin Wagner, Andrea Rossi, Miguel Mateo	IEEE Electric Vehicles and Renewable Energy EVER - April 2017 - Monaco, France »»»
Road2CPS Priorities and Recommendations for Research and Innovation in Cyber-Physical Systems	Nuria de Lama, Juan Alonso, Juan Rico et al	January 2017 - ISBN: 978-3-95663-117-7 »»»
Marshaling information and communication technologies towards ubiquitous personalized learning experiences	Ana Mª Piñuela, Nadia Politou et al.	IEEE Communications Magazine (To be published)
Emerging ICT technologies for the public sector - how innovating the public sector helps meeting societal needs	Nuria Rodríguez, Esther Garrido et al.	23rd ICE/IEEE ITMC conference 2017 »»»
EO Big Data analytics for the discovery of new trends of marine species habitats in a changing global climate	Jose Lorenzo et al.	Paper-Poster from the EO4wildlife project (eo4wildlife.eu), accepted at the 2017 Conference on Big Data from Space (BiDS'17) hold in Toulouse, France in November »»»
EO Big Data Connectors and Analytics for Understanding the Effects of Climate Change on Migratory Trends of Marine Wildlife	Jose Lorenzo et al.	Paper describing some of the research activities of the EO4wildlife project (eo4wildlife.eu), that received the Best Paper Award at the International Symposium on Environmental Software Systems (ISESS) 2017 Conference hold in Zadar, Croatia, in May »»»

Event	Presentation Title	Speaker		
Springer Series, Internet of Things Technology, Communication and Computing	SMART-FI: Exploiting Open IoT Data from Smart Cities in the Future Internet Society	Malena Donato, Omer Ozdemir, et al.		»»»
H2020 Infoday at Erandio	Introduction to ARIES Project	Pedro Soria	Erandio, Spain	
CEN-CENELEC Workshop on Interoperability of Security Systems for the Surveillance of Widezones	Round table: Interoperability of security systems for the surveillance of widezones	Jaime Martín Pérez	Athens, Greece	»»»
WATIFY Webinar	Cloud	Daniel Field	Online	
Smart Grids Congress	SHAR-Q: Interoperabilidad y descentralización como ejes del futuro ecosistema energético	Juan Rico	Madrid, Spain	»»»
EIT Health Summit 2017	Health & Inclusion @Workplace	Lydia Montandon	London, UK	
Fiware Summit	Connecting IoT To FIWARE platform - FIWARE IoT Agents - City Go: Bringing your sensors - Building your own IoT agent	Jose Gato, Daniel Calvo, Omer Ozdemir	Málaga, Spain	»»»
"Turning Cities into Platforms; Fireware Tech Summit"	City Enabler: Changing the way to give value to your data in the city	Esther Garrido	FYCMA, Málaga (Spain)	»»»
Registration of Identity, Working Party meeting on Frontiers / False Documents, Council of the EU	ARIES: Towards a Privacy-preserving Reliable European Identity Ecosystem	Alberto Crespo	Brussels, Belgium	»»»
Smart City Expo World Congress	Stand with CEDUS papers	Miquel Milà	Barcelona, Madrid	»»»
Security, Democracy & Cities. Coproducing Urban Security Policies	Technologies for Prevention	Aljosa Pasic	Barcelona	»»»
ISSE Information Security Solutions Europe 2017	WITDOM: You are outsourcing your data to the cloud, is it efficiently protected?	Nuria Ituarte	Brussels, Belgium	»»»
SMECluster Event 4	C2NET - Cloud Collaborative Manufacturing Networks	Jorge Rodriguez	Waterton (Wales)	»»»
The 36th International Conference on Conceptual Modeling (ER 2017)	Member of the panel "MAY INDUSTRY BENEFIT FROM CONCEPTUAL MODELING IN BIG DATA?"	Iván Martínez Rodríguez	Valencia, Spain	»»»
NEM Summit 2017	WATIFY: Awareness raising campaign for the modernization of Europe's industry	Lydia Montandon	Madrid, Spain	»»»
European Big Data Value Forum, EBDVF 2017	Member of the panel "DATA SHARING AND DATA INTEGRATION" Presentation "QROWD project: Involving humans in the big data loop"	Tomás Pariente Lobo	Versailles, France	»»»
EFUS Conference 2017	WATIFY: Awareness raising campaign for the modernization of Europe's industry	Aljosa Pasic	Barcelona, Spain	»»»
European Big Data Value Forum 2017	Big Data Value PPP networking sessions (organised by BDVe project)	Nuria de Lama	Paris, France	»»»
WATIFY Webinar	Digital Transformation for the Olympic Games	Jaume Pérez	Online	
WATIFY Webinar	Using HPC for boosting the Industry	Javier Nieto de Santos	Online	
WATIFY Webinar	AI and Robotics for the Digital Age	Orlando Avila	Online	
Information Security Solutions Europe (ISSE)	Three presentations about TREDISEC project including exploitation, innovation and demo of the TREDISEC Framework.	Jose Francisco Ruiz, Elena González	Brussels	
European Utility Week	Booth - inteGRIDy project	Javier Valiño, Andrea Rossi	Amsterdam, Netherlands	»»»
CEN/CENELEC Workshop	CEN/CENELEC Workshop Agreement preparation meeting	Aljosa Pasic	Athens, Greece	
Digital Transformation of Public Administrations Event	Sustainability and Exploitation of Horizon 2020 eGovernment Projects Results : SONNETS	Esther Garrido	Brussels, Belgium	»»»
Atos Research and Innovation Digital Show	Presentation of ARI's key assets such as: Pocket mHealth, City Go, PIAM and CapturEAN Presentation of WATIFY and WISER	Lydia Montandon, Aljosa Pasic, Malena Donato, Tomas Pariente, Angel Palomares, Carlos Cavero	Madrid, Spain	»»»
Global R&D Innovation Excellence Summit	WATIFY Campaign: Boosting digital and technological transformation	Lydia Montandon	Madrid, Spain	»»»

Event	Presentation Title	Speaker		
Empowering Smart solutions for Better Cities	WATIFY Campaign: Boosting digital and technological transformation	Juan Bareño	Budapest, Hungary	»»»
inteGRIDy International Conference	Opening remarks about inteGRIDy project and EU innovations on Smart Grid	Javier Valiño	Milan, Italy	»»»
C2NET Serminar	C2NET - Cloud Collaborative Manufacturing Networks	Jorge Rodriguez	Tampere (Finland)	»»»
SONNETS webinar: Tools to manage Innovation in the Public Administration	SONNETS introduction and sustainability approach	Nuria Rodriguez, Esther Garrido		»»»
IoT Smart London Summit	WATIFY: Awareness raising campaign for the modernization of Europe's industry	Aljosa Pasic	London, United Kingdom	»»»
Second Joint Workshop DSP Cluster	Presentation of TREDISEC project and demo of EPICA (Multi-Tenancy Access Control Primitive) developed inside the context of this project.	Javier Garcia		
World e-ID & CyberSecurity	WATIFY: Awareness raising campaign for the modernization of Europe's industry	Aljosa Pasic	Marseille, France	»»»
CITE 2017 -The 1st International Workshop on Creating Identity - Trustworthy Ecosystems	Introduction to ARIES	Eduardo González	Reggio Calabria, Italy	»»»
WATIFY Webinar	Digital Transformation in e-Government	Aljosa Pasic	Online	»»»
ARES Conference	ZONeSEC: built-in cyber-security for wide area surveillance system	Aljosa Pasic	Reggio Calabria, Italy	»»»
WATIFY Webinar	IoT in Manufacturing	Jorge Rodriguez	Online	»»»
ARI Digital Show: Innovation Workshop	WISER Workshop, Seguridad cibernética en la práctica	Aljosa Pasic, Susana González	Madrid	
5th Hellenic forum for science, technology & innovation	WATIFY Campaign: Boosting digital and technological transformation	Lydia Montandon	Athens, Greece	»»»
"VII Jornadas eMadrid ""Education in exponential times"". Lightning Talk."	MaTHiSiS: Desde un enfoque lineal hacia una educación ubicua y continua	Nadia Politou, Lydia Montandon	Madrid, Spain	»»»
WATIFY Webinar	IoT and Energy	Juan Rico	Online	»»»
European Sustainable Energy Week 2017	Booth - BRIDGE Initiative, inteGRIDy	Andrea Rossi	Brussels, Belgium	»»»
JNIC 2017 - III National Cybersecurity Research Days	Improve SIEM capabilities within CIPSEC project, Madrid, Spain, June 2, 2017 (JNIC 2017 - III National Cybersecurity Research Days)	Joaquín Rodríguez Rodríguez	Madrid	
30th BLED eConference	WATIFY: Awareness raising campaign for the modernization of Europe's industry	Lydia Montandon	Bled, Slovenia	»»»
Next Generation User Authentication by Voice Biometrics? Ready to Market! (OCTAVE Project Final workshop)	The Integrated Solution of OCTAVE	Jose Lorenzo	Florence, Italy	»»»
GaliciaTIC 2017	WATIFY Campaign: Boosting digital and technological transformation	Clara Pezuela	Santiago de Compostela, Spain	»»»
ICE Conference 2017	WATIFY Campaign: Boosting digital and technological transformation	Jorge Rodriguez	Madeira, Portugal	»»»
ICE IEEE Conference 2017	COMPOSITION (Ecosystem for Collaborative Manufacturing Processes Intra- and Inter-factory Integration and Automation)	Jorge Rodriguez	Madeira (Portugal)	»»»
BizFeira	WATIFY Campaign: Boosting digital and technological transformation	Lydia Montandon	Santa Maria de Feira, Portugal	»»»
23rd ICE/IEEE ITMC conference 2017	SONNETS final event: Contributing to reshape and reform the public sector into a technology leader and innovation breeding carrier	Nuria Rodríguez, Esther Garrido	Madeira Island, Portugal	»»»
Workshop about e-Health: Privacy, Security, Telemedicine	VisiOn: Technological platform for personal data privacy management	Jose Francisco Ruiz	Madrid	
DES Madrid 2017	WATIFY: Awareness raising campaign for the modernization of Europe's industry	Lydia Montandon	Madrid, Spain	»»»

Event	Presentation Title	Speaker		
The Joint Showcase Event of ABC4EU and BODEGA projects	ABC4EU Mobile System Demo	Ross Little	Levi, Finland	>>>
FIWARE Summit 2017	Smart Supply Chain Panel	Jorge Rodriguez	Utrecht (Holland)	>>>
Porvoo 19 Conference: Identity in a changing world	ARIES EU Project: Virtual and mobile IDs cryptographically derived from strong eID documents.	Nicolás Notario	Rome, Italy	>>>
CIPRE 2017	ZONeSEC, towards an EU framework for the security of widezones	José Ramón Martínez Salio	The Hague	>>>
SONNETS workshop: Innovating the public sector with emerging ICTs - development of research directions	Introduction to the SONNETS project	Nuria Rodríguez	Cologne, Germany	>>>
III Congreso de Ciudades Inteligentes	SMART-FI facilita usar y compartir los datos abiertos de las Ciudades Inteligentes.	Malena Donato, et al.	Madrid, Spain	>>>
ClimatEurope Festival	CLARITY: Integrated Climate Adaptation Service Tools for Improving Resilience Measure Efficiency	Miguel Ángel Esbrí	Valencia, Spain	>>>
IEEE EVER - Ecological vehicles and renewable energies	Real time energy efficiency optimization in connected vehicles	Juan Rico	Monaco	>>>
Setting the basis for a future Operational Control Platform for CSDP missions" workshop	Introduction to CIVILEX: objectives, strategy and potential users	Sara Diez Mínguez	Brussels, Belgium	>>>
Artemis Brokerage Event 2017	WATIFY Campaing: Boosting digital and technological transformation	Nuria de Lama	Brussels, Belgium	>>>
Parallel End-User and Supplier Workshops on standardisation needs and opportunities	New standardization opportunities for industry	Jaime Martín Pérez	Brussels, Belgium	>>>
Jornada sobre el topic SEC-05-DRS-CBRN-2017	Atos approach for DRS-05	Jaime Martín Pérez	Madrid, Spain (CDTI)	>>>
SONNETS workshop: Emerging ICTs and Innovation Potential for the Public Sector	The SONNETS project: An Introduction	Nuria Rodríguez	The Cube, Athens, Greece	>>>
Digital Social Innovation Fair 2017	WATIFY Campaing: Boosting digital and technological transformation	Lydia Montandon	Rome, Italy	>>>
Chemical, biological, radiological and nuclear (CBRN) cluster	Atos overview, competencies and ideas for CBRN	Jaime Martín Pérez	Paris, France (Ministère de la...)	>>>
Smart Cyber-Physical Systems - Concertation Event	Road2CPS final results	Nuria de Lama	Brussels, Belgium	>>>



Best Booth Award at EuCNC for the iKaaS Project [Jun 2017]

The iKaaS project received the "Best Booth Award" at the EUCNC 2017, held in Oulu, Finland from 12-15th of June. The exhibition comprised some 40 stalls, showing both commercial and research demos. The iKaaS booth was voted as the best demo at conference.

Platforms

Introduction

Even though most Public Bodies carry out public and private consultations to elaborate their research program, in the last years there has been an industry-led movement aiming at better coordinating and defining research areas and instruments, both at European and National levels. The main benefit of these initiatives is that industrial partners, including SMEs (in many cases also academia and research centers), discuss which are the main priorities for the sector in terms of R&D and provide this input to the related funding organisations. This ensures a greater impact of the program. The main characteristics of these initiatives are that they are well organized, with mechanisms for open participation and represent a critical mass of stakeholders with a unique voice. Therefore, they are considered the natural interface to interact with a specific industry or sector.

Nowadays the spectrum of initiatives is quite vast in terms of both thematic areas and instruments. From an instrument point of view we can distinguish ETP (European Technology Platforms), JTI (Joint Technology Initiatives), Lead Market Initiatives and PPP (Public Private Partnerships).

From the viewpoint of research areas, we depict hereafter a brief classification of current ETP, JTI, PPP and other initiatives. It is by no means a complete list, but a selection of some relevant initiatives for Atos, where the Research & Innovation group plays a major role.



Nuria De-Lama
ICT Program Manager

European Technology Platforms (ETPs)

Atos is a founding member of the European Technology Platform NESSI (Networked European Software and Services Initiative) and sits on the steering board of NetWorld2020.

	NetWorld2020 www.networld2020.eu
	NEM www.nem-initiative.org
	NESSI www.nessi-europe.com

Public Private Partnerships (PPPs)

Our company is a major partner in Future Internet-related initiatives being member of the FI PPP Steering Board and Industrial Advisory Board. Since 2014, Atos is a founding member of the Big Data Value Association (BDVA), assuming the roles of Vice-presidency and Deputy Secretary-general. We are also member of the 5G PPP Steering Board.

	ECSO www.ecs-org.eu
	AIOTI www.aioti.org
	EFFRA www.effra.eu
	Future Internet www.fi-ppp.eu
	NIS Platform resilience.enisa.europa.eu/nis-platform
	BDVA www.bigdatavalue.eu
	5G www.5g-ppp.eu

EIT Knowledge and Innovation Communities (KICs)

Atos is a core member of the KIC EIT Health and an official member of the KIC EIT Digital associated node Madrid.

	EIT HEALTH www.eithealth.eu
	EIT-DIGITAL www.eitclabs.eu

National Technology Platforms (NTPs)

At national level, Atos is currently holding the Presidency and Secretary of PLANETIC for ICT, as well as the Vice-presidency of es.Internet for Future Internet technologies, and is member of several others, such as PESI, Logistop, eVIA for Health and Independent Living, NanoMed or the Spanish Railways Technology Platforms.

	PTFE www.ptferroviaria.es
	PLANETIC www.planetic.es
	PESI www.pesi-seguridadindustrial.org
	NANOMED www.nanomedspain.net
	LOGISTOP www.logistop.org
	ES.INTERNET esinternet.imasdtic.es
	eVIA ametic.es/es/innovacion/plataformas-tecnologicas/evia

Standardization Organizations

	OASIS www.oasis-open.org
	ETSI www.etsi.org

Special Interest Groups

	FIWARE Foundation www.fiware.org/foundation
	ERTICO ertico.com
	EOS www.eos-eu.com
	CELTIC celticplus.eu
	Smart Cities Platform eu-smartcities.eu

About Atos

Atos SE (Societas Europaea) is a leader in digital transformation with circa 100,000 employees in 72 countries and pro forma annual revenue of circa € 12 billion. Serving a global client base, the Group is the European leader in Big Data, Cybersecurity, Digital Workplace and provides Cloud services, Infrastructure & Data Management, Business & Platform solutions, as well as transactional services through Worldline, the European leader in the payment industry. With its cutting edge technologies, digital expertise and industry knowledge, the Group supports the digital transformation of its clients across different business sectors: Defense, Financial Services, Health, Manufacturing, Media, Utilities, Public sector, Retail, Telecommunications, and Transportation.

The Group is the Worldwide Information Technology Partner for the Olympic & Paralympic Games and is listed on the Euronext Paris market. Atos operates under the brands Atos, Atos Consulting, Atos Worldgrid, Bull, Canopy, Unify and Worldline.

Find out more about us

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More thoughts and inspiration at ascent.atos.net

Let's start a discussion together



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