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# Research & Innovation 2018

Innovation is in our DNA  
Come with us to the future of technologies

Trusted partner for your Digital Journey

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# Innovation is in our DNA

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

Welcome to our presentation of Atos Research & Innovation (ARI). We hope that you will enjoy your reading across the different sections of this booklet.

You will find a description of our current activities, including a link to all ongoing projects, in the "[Sectors](#)" and "[Labs](#)". If you wish to know more about past activities, you may check "[Print Editions](#)" sections within the "About" menu of our [website](#).

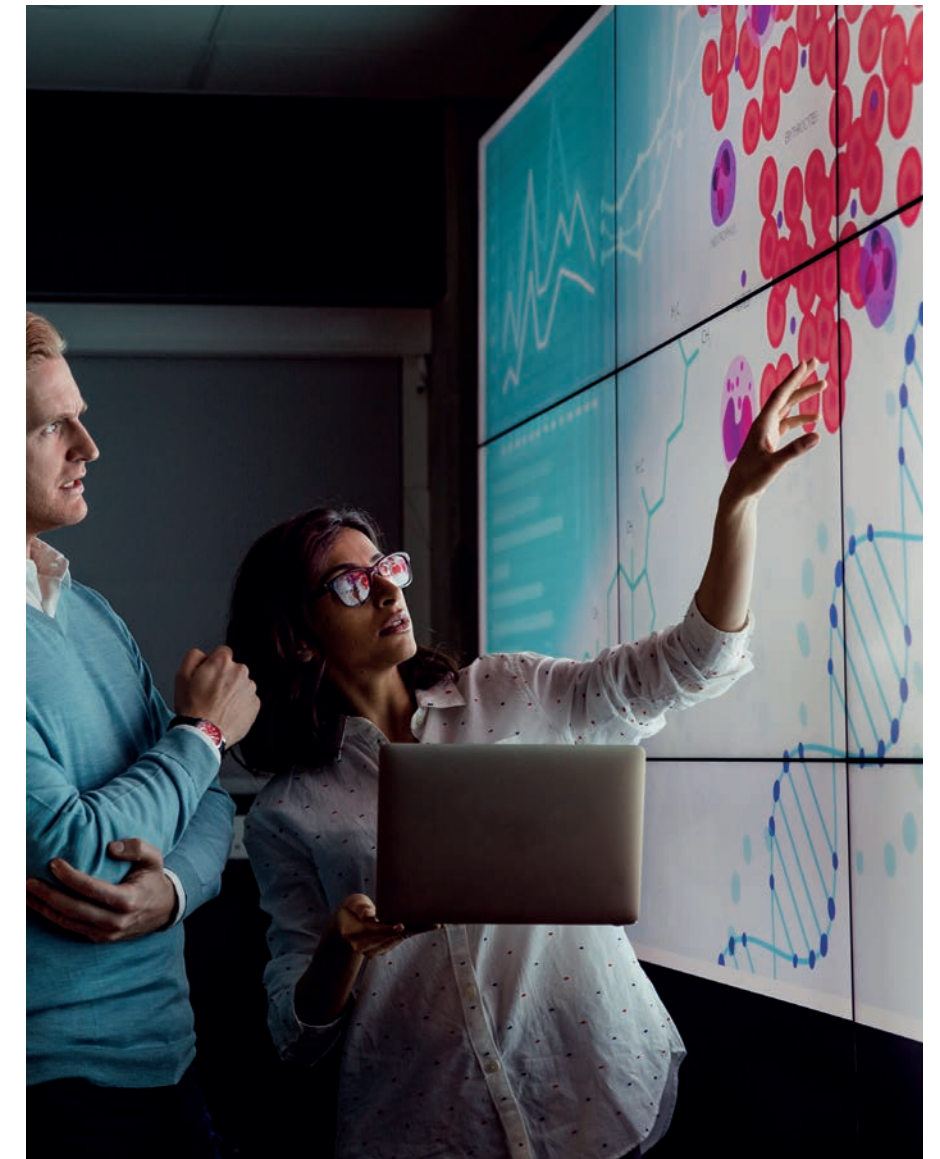
Our mission is to investigate emerging technologies and anticipate market demand with innovative solutions. However, logically, one of the main challenges faced by our group is to reduce the gap between research, innovation and the market. Due to the progress made in approaching different teams within Atos, as well as directly with potential customers, ARI's [Innovation Hub](#) 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](#), the European Factories of the Future [EFFRA](#), 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.

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 [ari-marcom@atosresearch.eu](mailto:ari-marcom@atosresearch.eu), we are happy to take it into consideration!



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:

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

Our team is distributed in various locations: Madrid, Barcelona, Bilbao, Santander, Sevilla, Valladolid, Santa Cruz de Tenerife in Spain and Brussels in Belgium. 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.

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.

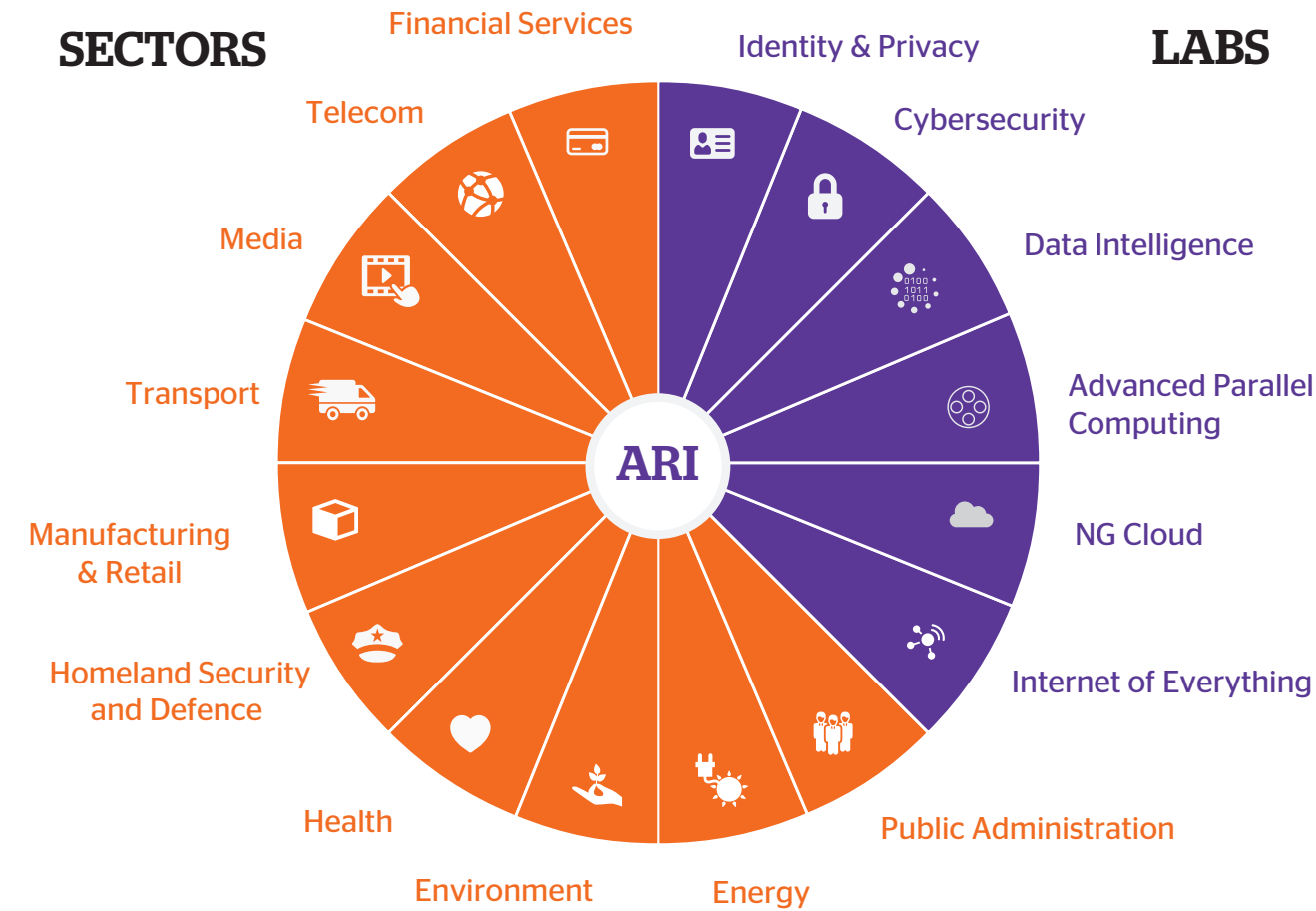
Based on the day-to-day activity in research and innovation projects, our group has developed efficient working processes, templates, knowledge base, and collaborative tools. From strategy to project management, from the generation of ideas to the identification of funding opportunities and selection 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,

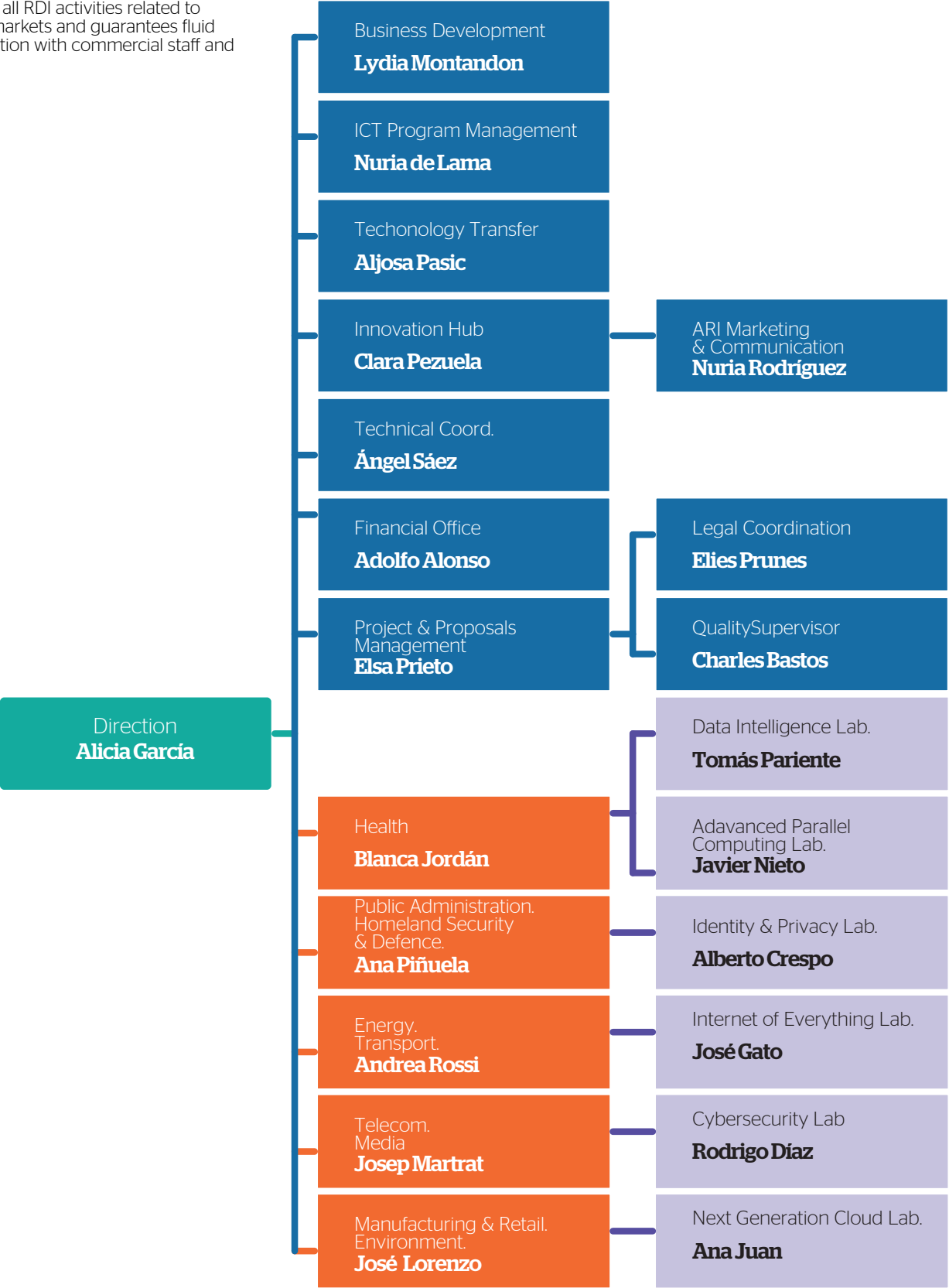
such as: advanced technology watch; innovations ideas channeling; evaluation and management; alignment of the organization's RDI strategy with public funding sources programs; proposal drafting and delivery; proposals negotiation; and proper project management office.





# 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

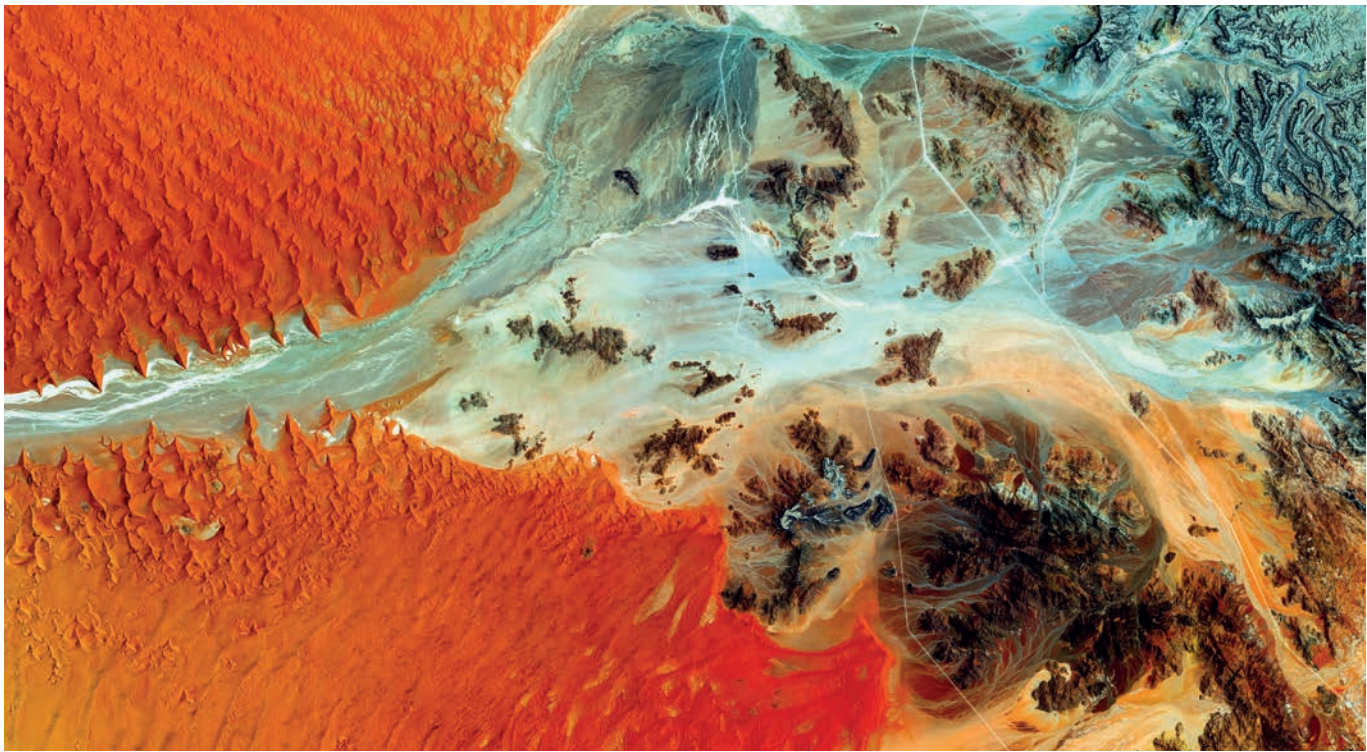


# Sectors





Geospatial technologies that support the development of distributed geo-spatial processes



Mission

Our mission is to design and implement architectures that involve the use and process of geospatial information. Our research in the geospatial domain applies to Earth Observation Data for wildlife monitoring, agriculture monitoring, provision of modelling and analytics tools, measure planning and decision support for climate change, geographic information for Open Data and Big Data, and driving innovation in Crisis Management.

Vision

Our vision is to address current and future challenges related to:

- Earth Observation and Security providing inputs to the Copernicus and GEOSS initiatives.
- Multiple Risk and Emergency Management, applying results of previous projects in early warning for tsunamis, biodiversity, cultural heritage, agriculture, etc.
- Observation Web with associated environmental enablers for the Future Internet.

Additionally, we aim to be a reference partner for the developments needed to adopt the INSPIRE directive in the Public Administration

Values

With the main goal of promoting the adoption of emerging geospatial technologies, and with a strong relationship with the Geospatial Information Research Line, that provides the technical and thematic knowledge in this domain, the Environment Sector looks for:

- Integration of in-situ & EO observations from environmental sensors
- Use of large array databases (i.e. Rasdaman) for the massive storage and analysis of raster-based information (e.g. satellite imagery)
- Service Oriented Architecture (SOA) for accessing and processing geospatial information
- Expertise on Open Geospatial Consortium (OGC) standards such as WMS, WFS, WPS, WCS, SWE...
- Implementation of geographical independent decision support and alerting systems (e.g. for the prevention of disasters)

Projects

Title	Project Title	Funding	Description
<b>BONVOYAGE</b> <a href="http://bonvoyage2020.eu">bonvoyage2020.eu</a>	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.
<b>CANDELA</b> <a href="http://www.candela-h2020.eu">www.candela-h2020.eu</a>	Copernicus Access Platform Intermediate Layers Small Scale Demonstrator	H2020, SPACE	Creation of value from Copernicus data through the provisioning of modelling and analytics tools.
<b>CLARITY</b> <a href="http://www.clarity-h2020.eu">www.clarity-h2020.eu</a> <a href="http://myclimateservice.eu">myclimateservice.eu</a>	Integrated climate adaptation service tools for improving resilience measure efficiency	H2020, CLIMATE	Exploiting/demonstrating the added value of climate services for climate-proofing of vulnerable urban and transport infrastructure.
<b>DataBio</b> <a href="http://www.databio.eu">www.databio.eu</a>	Data-Driven Bioeconomy	H2020, BIG DATA PPP	Big Data PPP Large Scale Pilot focusing on the production of best possible raw materials from agriculture, forestry and fishery/aquaculture.
<b>EO4AGRI</b> <a href="http://www.eo4agri.eu">www.eo4agri.eu</a>	Bringing together the Knowledge for Better Agriculture Monitoring	H2020, SPACE	Evolution of the European capacity for improving operational agriculture monitoring, based on information from Copernicus satellite data, and through the exploitation of associated geospatial services.
<b>EO4wildlife</b> <a href="http://eo4wildlife.eu">eo4wildlife.eu</a>	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.
<b>EUXDAT</b> <a href="http://www.euxdat.eu">www.euxdat.eu</a>	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, perform predictions and simulations with extremely large and heterogeneous datasets.
<b>SMART GROUND</b> <a href="http://www.smart-ground.eu">www.smart-ground.eu</a>	Smart data collection to enhance availability and accessibility of data 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.



José Lorenzo  
Head of Sector



# Manufacturing and Retail

## Intelligent technologies for manufacturing and retail challenges



### Mission

We are focusing on helping industrial companies in their digital transformation by providing them the required support and tools to adopt new ICT technologies that increase their competitiveness and unlock infinite possibilities to improve the manufacturing process with sufficient interoperability between traditional Operational Technologies and ICT.

### Vision

Through the research and adoption of ICT technologies such as IoT, Big Data, AI, and Cloud Computing, we are helping organizations to face the Fourth Industrial Revolution, also named Industry 4.0, which aims at digitizing the European Industry and fostering digital transformation, based on Digital Platforms, Large-scale Piloting, Ecosystem building, and standardization. In addition, the Sector is contributing to the development of a sustainable economy for the retail industry by giving citizens' easy access to affordable and high-quality consumables.

### Values

ARI has a unique position to help European industrial companies in their digital transformation, thanks to its deep knowledge and a team of experts in the Manufacturing and Retail domain with a broad experience in Digital Platforms combining the most relevant ICT technologies such as IoT, Big Data, AI, Cybersecurity, HPC, among others. Furthermore, the development of innovative solutions with the capacity of the number one ICT company in Europe, is fundamental to transfer solutions to the market.

### Projects

Title	Project Title	Funding	Description
<b>COMPOSITION</b> <a href="http://www.composition-project.eu">www.composition-project.eu</a>	Ecosystem for collaborative manufacturing processes	H2020	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.
<b>INTEGRADDE</b> <a href="http://www.integraddeproject.eu">www.integraddeproject.eu</a>	Intelligent data-driven pipeline for the manufacturing of certified metal parts through Direct Energy Deposition processes	H2020	Development of a new manufacturing methodology capable of ensuring the manufacturability, reliability, and quality of a target metal component from initial product design via Direct Energy Deposition (DED).
<b>MIDIH</b> <a href="http://midih.eu">midih.eu</a>	Manufacturing Industry Digital Innovation Hubs	H2020-FoF	Digitization of the manufacturing industry to boost investment and collaborations through strategic partnerships and networking.
<b>OEDIPUS</b> <a href="http://www.eitdigital.eu">www.eitdigital.eu</a>	Operate European digital industry with products and services	EIT-DIGITAL	High Impact Initiative (HII), belonging to the Digital Industry Action Line of EIT Digital, to create innovative solutions and business opportunities for European industrial players, corporations, and SMEs.



Jorge Rodríguez Edroso  
Head of Sector



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



## Mission

Our mission is to support better clinical, biomedical and self-care outcomes by researching on ICT services and application of technologies such as big data, data interoperability, artificial intelligence, IoT, blockchain in the biomedical domain for the improvement of services for doctors, researchers, and patients; applying our knowledge and research results to the development of innovative solutions and services; and transferring technology outcomes from research projects to Atos portfolio.

## Vision

While citizens expect better healthcare delivery, we are facing challenges related to demographic, budgetary and medical staff shortage pressures. The digital transformation of the healthcare system will be underpinned by:

- Standard-based transformation of unstructured and uncodified biomedical data to standardized structures and code systems;
- Hybrid HPC-cloud-based infrastructures for supporting big data and computational demanding analysis;
- AI-based algorithms for unveiling biomedical complexity;
- IoT-based ubiquitous and mobility-proof networks for keeping actors connected anytime anywhere;
- Blockchain-based secure data sharing for patient empowerment.

## Values

Our focus is on topics such as medical data interoperability, information management, artificial intelligence for precision medicine, remote monitoring and patient assistance. In the last years, the sector has been focused on blockchain-based federated databases, bioinformatics, algorithms and big data development for omics data analysis. In addition, we believe in:

- Interoperability layer based on SNOMED & LOINC medical dictionaries, standards for medical devices communication and electronic health records.
- Data acquisition, curation, and integration of biomedical data, based on HL7 RESTfull transformation to generate structured data ready for data analysis.
- Pocket mHealth empowers patients in the management of their own Electronic Health Record (EHR) and connecting with different Hospital Information Systems (HIS)
- Terminology Service, to provide a set of semantic operations over medical terminologies, including the linking of local codes to standard code.

## Projects

Title	Project Title	Funding	Description
<b>CrowdHEALTH</b> <a href="http://www.crowdhealth.eu">www.crowdhealth.eu</a>	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.
<b>FACET</b> <a href="http://www.eithealth.eu/facet">www.eithealth.eu/facet</a>	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.
<b>Fair4Health</b> <a href="http://www.fair4health.eu">www.fair4health.eu</a>	Encouraging the re-use of research data generated by publically funded research projects	H2020	Aims at joining efforts to facilitate researchers to share and reuse databases derived from publicly funded research, within a secure environment, to accelerate the discovery and investigation of chronic diseases.
<b>HarmonicSS</b> <a href="http://harmonicss.eu">harmonicss.eu</a>	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.
<b>HeartMan</b> <a href="http://www.heartman-project.eu">www.heartman-project.eu</a>	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.
<b>Liv:IN</b> <a href="http://www.living-innovation.net">www.living-innovation.net</a>	Living Innovation	H2020	Implementing Responsible Research and Innovation (RRI) through co-creation of smart futures with industry and citizens.
<b>We@Work</b> <a href="http://www.eithealth.eu/we-work">www.eithealth.eu/we-work</a>	Wellbeing, Health and Safety @ Work	EITH	Prevention of work-related injuries with a platform that combines Big Data, wearable sensors, IoT technology, and ergonomics to monitor workers and detect threats to their health.



Blanca Jordán Rodríguez  
Head of Sector



Manuel Pérez  
Deputy Head of Sector



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



Mission

Our mission is to support the evolution and transformation of this field from an asset approach towards a most efficient, open, inclusive, innovative and data-driven environment, through the provision of the right tools, platforms, and methodologies. In addition, digitalization plays a key role and, in many cases, it is out of the traditional area of expertise of energy actors, so the adoption of emerging and well-adopted technologies such as IoT, Blockchain, AI, among other state-of-the-art technologies, demands the definition of proper business cases to pave the way to introducing innovation into a traditional sector.

Vision

The evolution of a traditional sector demands the coexistence of emerging and legacy solutions, standards for communication at the lower layer and preparation of the data to be analyzed. Platforms should be designed to fit into the reality of the energy sector and be prepared for addressing the coming challenges. By developing FUSE (Framework for Utilities and Services) to foster the collaboration among different energy vectors (power, gas, heat ...), the vision is to reduce integration problems while keeping under control data sharing and interaction among different actors.

Values

Our key asset is the FUSE platform, based on open standards and open APIs to support interoperability, modularity, scalability and also funnel an inclusive energy ecosystem. Main challenges are:

- Management of data heterogeneity and its preparation for service development.
- Sustainable integration of electric vehicles in cities and the management of energy flows to address their charging needs
- Management of Distributed energy resources to optimize grid operation and maintenance activities
- Customer segmentation based on consumption patterns
- Cross-energy vector collaboration to maximize the renewable generation capacity, promote self-consumption and reduce the dependence on fossil fuels.

Projects

Title	Project Title	Funding	Description
<b>eDREAM</b> <a href="http://edream-h2020.eu">edream-h2020.eu</a>	Enabling new Demand-Response advanced, market-oriented and secure technologies, solutions and business models	H2020	Near-real-time closed-loop Demand Response fully autonomous, secure and decentralised framework, exploiting Blockchain and Big Data technologies.
<b>ELVITEN</b> <a href="http://www.elviten-project.eu">www.elviten-project.eu</a>	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.
<b>inteGRIDy</b> <a href="http://www.integridy.eu">www.integridy.eu</a>	Integrated smart grid cross-functional solutions for optimized synergetic energy distribution and 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.
<b>JOSPEL</b> <a href="http://jospel-project.eu">jospel-project.eu</a>	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 systems.
<b>SHAR-Q</b> <a href="http://www.sharqproject.eu">www.sharqproject.eu</a>	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



Juan Rico  
Head of Sector

# Public Administration

ICT is key to promote smart, sustainable & innovative government



## Mission

Our main goal is to encourage the adoption of emerging technologies in the Public Administration sector to help public administrations at all levels to deliver more efficient and effective public services in line with the needs and demands of citizens and businesses or organizations.

## Vision

By contributing to the implementation of the eGovernment Action Plan 2016-2020 at different levels in the European Member States, we are working towards the construction of a Single European Administrative Space, with a vision of seamless cross-organizational and cross-border services and the adoption of disruptive technologies such as Blockchain, AI, HPC, Big Data, IoT, among others.

In addition, we believe that providing tools that support technology use and digital competence development will boost the Digital Education Plan.

## Values

We provide value to the European Member States with its research on ICT tools to implement more efficient services with special focus on interoperability, cross-organizational flows, HPC, Big and Open Data, Cloud, Blockchain, for challenges such as migrant integration; as well as tools with a strong education orientation focused on personalization, student experience, lifecycle management, and contextualized eLearning.

Through this type of solutions and research projects, the European Public Administrations will also be able to develop a framework for the assessment of the viability of potential innovation solutions for the public sectors and a roadmap with actions needed towards achieving the expected impacts for the public sector and the society at large.

## Projects

Title	Project Title	Funding	Description
<b>BDVe</b> <a href="http://www.big-data-value.eu">www.big-data-value.eu</a>	Big Data Value Ecosystem	H2020	Support the Big Data Value PPP in realizing a vibrant data-driven EU economy and contribute to the implementation of the PPP.
<b>Big Policy Canvas</b> <a href="http://www.bigpolycanvas.eu">www.bigpolycanvas.eu</a>	Big Policy Canvas	H2020	Fosters collaboration among Public Sector stakeholders and offers a solid knowledge base towards building a more evidence-based public sector, promoting transparency.
<b>CEDUS2</b> <a href="http://cityenabler.eng.it">cityenabler.eng.it</a>	Unlocking the potential of data in your city	EIT-DIGITAL	Provides tools for cities to collect, organize, harmonize and give value to historic and near real-time urban information, coming from several sources.
<b>MaTHISIS</b> <a href="http://www.mathisis-project.eu">www.mathisis-project.eu</a>	Managing affective-learning through intelligent atoms and smart interactions	H2020	Integrated platform for adaptive learning, automatic feedback, automatic assessment of learner's progress and behavioral state, effective learning and game-based learning.
<b>NEWTON</b> <a href="http://www.newtonproject.eu">www.newtonproject.eu</a>	Networked labs for training in sciences and technologies for information and communication	H2020	Pan-European learning network platform that supports fast dissemination of learning content to a wide audience in a ubiquitous manner.
<b>Science2Society</b> <a href="http://www.science2society.eu">www.science2society.eu</a>	Improving university, industry and society interfaces to boost Europe's innovation stakeholders	H2020	Good practices, guidelines and training materials to improve awareness and practical performance in university-industry-society interfacing.
<b>Student Mobility Study</b>	Feasibility study on cross-border use of eID and authentication services	Commercial Project	Describes 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.

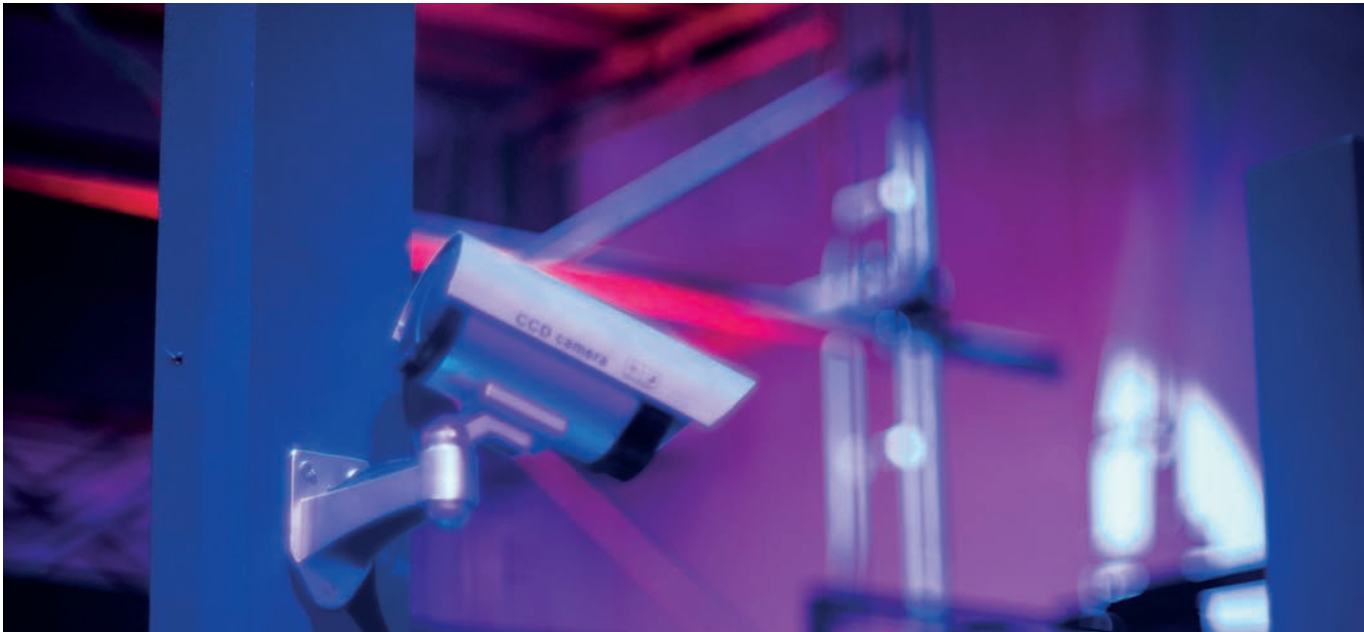


Ana María Piñuela  
Head of Sector



# Homeland Security & Defence

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



### Mission

We aim to encourage the adoption of emerging technologies by the industry and public institutions in the defense and security arena, and especially in the homeland security field. Part of our mission is also to 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

### Vision

We are working towards fostering EU excellence by identifying links between the EU Common Foreign and Security Policy (CFSP), with emerging technologies, to explore “dual use” technologies such as defense tech applicable in civil security, and to deliver more for less including cloud-based solutions, data and info sharing, etc.

In addition, we aim at avoiding duplication and pool resources by allowing interoperability and collaboration among Homeland, Security and Defence organizations which are immersed in the development of NATO, EDA or other EU cooperation frameworks.

### Values

Our values focus on:

- 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, link, opinion, audio...), data and context fusion, and visual analytics
- Design, modeling, and simulation of forward-looking scenarios
- Automatic image processing and recognition in high demanding scenarios

### Projects

Title	Project Title	Funding	Description
<b>ALFA</b> <a href="#">alfa-h2020.eu</a>	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.
<b>BODEGA</b> <a href="#">www.bodega-project.eu</a>	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.
<b>CIVILnEXT</b> <a href="#">civilnext.eu</a>	Next generation of information systems to support EU external policies	H2020	Providing EU Civilian missions with a secure and cost-effective information system which enhances situational awareness, information exchange, and operational control.
<b>COSMIC</b> <a href="#">cordis.europa.eu/project/rcn/218212/factsheet/en</a>	CBRNE Detection in Containers	H2020	Addresses the fast inspection of containers in ports and crossing borders to detect Chemical, Biological, Radiological and Nuclear (CBRN) materials.
<b>DRIVER+</b> <a href="#">www.driver-project.eu</a>	Driving Innovation in Crisis Management for European Resilience	H2020	Aims to develop and boost the uptake of innovative solutions to address the operational needs of practitioners dealing with Crisis Management (CM).
<b>PERSONA</b> <a href="#">persona-project.eecs.qmul.ac.uk</a>	Privacy, Ethical, Regulatory and Social no-gate crossing point solutions acceptance	H2020	Provides a unified Impact Assessment Method for No-Gate Crossing Point Solutions.
<b>ResiStand</b> <a href="#">resistand.eu</a>	Increasing disaster resilience by establishing a sustainable process to support standardisation of technologies and services	H2020	Roadmap for the empowerment of Crisis Management and European disaster resilience through standardisation, by ensuring that expectations of suppliers are adequately portrayed.
<b>TOXI-TRIAGE</b> <a href="#">www.toxi-triage.eu</a>	Integrated and adaptive responses to toxic emergencies for rapid triage: engineering the roadmap from casualty to patient to survivor.	H2020	Integrated concept of operation for crisis management in catastrophic Chemical, Biological, Radiological and Nuclear (CBRN) incidents.
<b>ZONeSEC</b> <a href="#">www.zonsec.eu</a>	Towards a EU framework for the security of widezones	FP7	European framework for widezones surveillance taking into consideration costs, complexity, vulnerability, societal acceptance, and ethics.



Ana María Piñuela  
Head of Sector

Innovation is essential for supply-chain stakeholders to remain competitive



Mission

Our mission is to design and operate digital services and platforms to support transport players transform for tomorrow's data-driven, multimodal transport economy, leveraging best of innovative technologies and business models for creating value for private and public stakeholders involved in the mobility and logistics sector. As the world becomes increasingly smart and connected, the sector must respond to consumer demands and expectations undergoing unprecedented digital transportation.

Vision

Our vision, as innovators in the Transport sector, is to prepare the right ecosystem around the value from new technologies and business models to the public and private transport stakeholders, to maximize their business and service efficiency, the development of new ones and facilitate the achievement of their environmental challenges. Data is at the heart of this transformation, notably, thanks to the mobile networks (5G) & IoT revolutions, which combined with AI technologies, enables to connect people, infrastructures, vehicles and ultimately passengers and freight with transport services and to better meet passenger & freight owners expectations.

Values

We support all types of transport players, as well as the broad transport ecosystem: road, rail, sea & air, logistics and postal. We deliver innovative transport applications and blueprints to help our transport stakeholders to reap rapidly and cost-efficiently the benefits of the latest digital technologies. As an example of a business accelerator, our vehicle data sharing marketplace AGORA and our logistics data sharing network help mobility and logistics partners with the promotion of new digital services to make the best business decisions with data and achieving competitive advantage.

Projects

Title	Project Title	Funding	Description
<b>AEOLIX</b> <a href="#">aeolix.eu</a>	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%.
<b>AUTOMAT</b> <a href="#">www.automat-project.eu</a>	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.
<b>CO-GISTICS</b> <a href="#">cogistics.eu</a>	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.
<b>CORE</b> <a href="#">www.coreproject.eu</a>	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.
<b>FREVUE</b> <a href="#">frevue.eu</a>	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.
<b>HOPE</b> <a href="#">hope-eu-project.eu</a>	Holistic personal public eco-mobility	FP7	Open platform capable of combining Interoperable Fare Management and Traveler Information Systems.
<b>NEWBITS</b> <a href="#">newbits-project.eu</a>	New business models for ITS	H2020	Provide a deep understanding of the changing conditions and dynamics that affect and/or influence C-ITS innovations.
<b>TT</b> <a href="#">transformingtransport.eu</a>	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.



Germán Herrero  
Head of Sector



New media and digital content management



Mission

Our mission is to design and develop ICT tools for both the Media Industry (broadcast, content production, press, etc) and the Media & Gaming Technologies with solutions and services, such as multi-platform efficient Media Content Management; Content recommendation and personalized advertising with content characterization, annotation, data fusion, and profiling; rich multimedia User Experience (UX); Social Network Analytics; Non-leisure gaming and gamification technologies; 3D Modeling and Virtual Space; Accessible Media contents and services; and media services deployment based on new network paradigms.

Vision

We are working towards the development of assets that are useful to Atos Group through the extensive knowledge and experience accumulated during several years in different R&D projects related to media technologies, in which they have achieved successful results with tools focusing on content annotation and enriched metadata for multimedia; multimedia search, distribution, and retrieval; 3D and virtual worlds; Adaptive Streaming; social media analytics related to media content; and "Design for all" principle, ensuring accessibility for users.

Values

Novel approaches and technologies allow general users to become media generators, producers and actors in an inter-connected, interactive and smart augmented world. Besides participating in R&D projects, we support the Atos Major Events Team to provision IT services for last sport events (i.e. Olympics Games). We have 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 are members of the NEM (New European Media) initiative Steering Board.

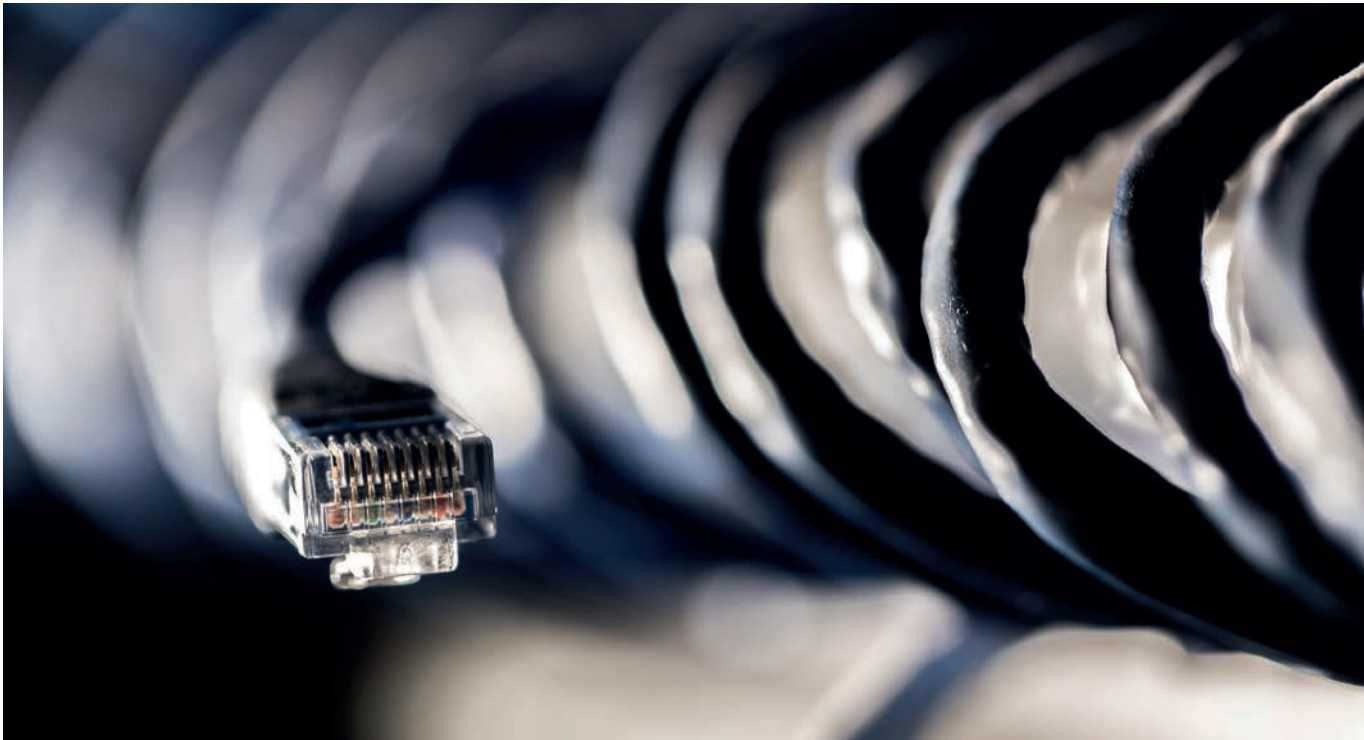
Projects

Title	Project Title	Funding	Description
<b>Flame</b> <a href="#">flame-project.eu</a>	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.
<b>ProsocialLearn</b> <a href="#">prosociallearn.eu</a>	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.
<b>Trillion</b> <a href="#">trillion-project.eng.it</a>	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.



Francesco D'Andria  
Head of Sector

# Novel network architectures and virtualized software networks



## Mission

We aim at leading the definition of new network architectures focusing on reducing the latency to the minimum, and increasing the bandwidth and number of devices connected to the network, through the development of advanced technologies that will enable new generations of mobile broadband networks to create new business opportunities for customers.

## Vision

Future mobile communications networks will act as a catalyst to encourage industries from all sectors to exploit their possibilities and generate use cases that were previously unthinkable. In this sense, the Telecom sector will be the fundamental pillar on which the changes will settle, for the future scenarios, in sectors such as eHealth, automotive, industry 4.0 or media & entertainment.

## Values

Thanks to our long trajectory over the years in National and European R&D programs, we have gained great expertise in new technologies that enable the development of future communications networks, such as Software Networks, NFV, SDN, Containers, Management and Orchestration, Multi-Access Edge Computing (MEC), among others. This allows us to make the new mobile communications generations a reality.

## Projects

Title	Project Title	Funding	Description
<b>5G ESSENCE</b> <a href="http://www.5g-essence-h2020.eu">www.5g-essence-h2020.eu</a>	Embedded network services for 5G experiences.	H2020	Platform to support new business models and revenue streams by creating a neutral host market and reducing operational costs by providing new opportunities for ownership, deployment, operation, and amortisation.
<b>5G-Monarch</b> <a href="http://5g-monarch.eu">5g-monarch.eu</a>	5G Mobile Network Architecture for diverse services, use cases and applications in 5G and beyond.	H2020	Software-defined networking (SDN), network functions virtualization (NFV), orchestration of access network and core network functions, and analytics, to support a variety of use cases in vertical industries such as automotive, healthcare, and media.
<b>5G-TRANSFORMER</b> <a href="http://5g-transformer.eu">5g-transformer.eu</a>	5G Mobile Transport Platform for Verticals	H2020	Defines three novel building blocks that will be developed and demonstrated integrating the aforementioned three vertical industries: Vertical Slicer, Service Orchestrator, Mobile Transport and Computing Platform.
<b>5GENESIS</b> <a href="http://5genesis.eu">5genesis.eu</a>	5th Generation End-to-end Network, Experimentation, System Integration, and Showcasing	H2020	Validation of the 5G network KPIs and verify the 5G technologies with an end-to-end approach for various 5G use cases, in both controlled set-ups and large-scale events.
<b>5GTANGO</b> <a href="http://5gtango.eu">5gtango.eu</a>	5G development and validation platform for global industry-specific network services and apps.	H2020	NFV-enabled Service Development Kit (SDK) to bridge the gap between business needs and network operational management systems.
<b>MATILDA</b> <a href="http://www.matilda-5g.eu">www.matilda-5g.eu</a>	5G-ready applications and network services over sliced programmable infrastructure.	H2020	Design and implementation of a novel holistic 5G end-to-end services operational framework tackling the overall lifecycle of 5G-ready applications and 5G network services over a programmable infrastructure.
<b>NGPaaS</b> <a href="http://ngpaas.eu">ngpaas.eu</a>	Next Generation Platform as a Service	H2020	5G cloud-native stack centered on a telco-grade PaaS for Dev-For-Operations processes supporting a multi-sided platform between operators, vendors and third-parties, and a revisited OSS model.

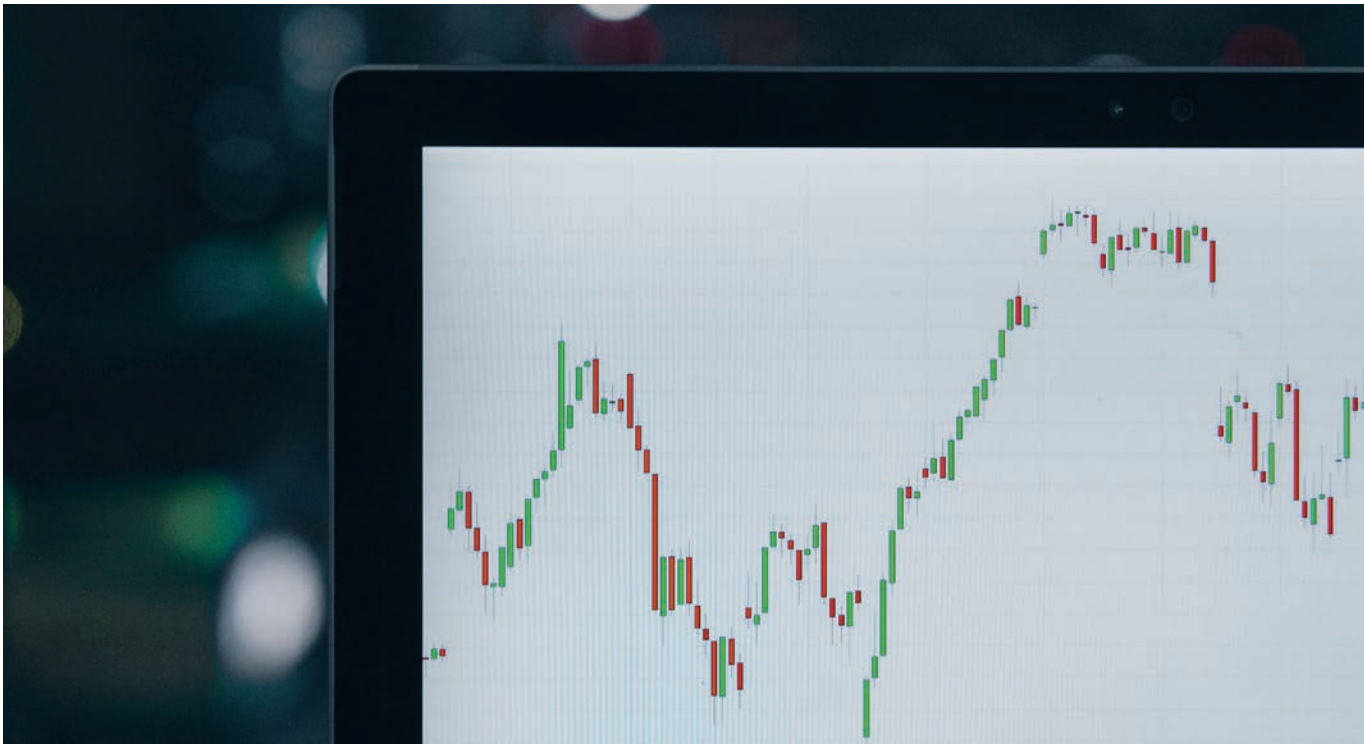


Josep Martrat  
Head of Sector



# Financial Services

## Adapting financial applications to the challenges of Future Internet and new ICT



### Mission

Our mission is 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.

### Vision

Our vision is to help customers in the Financial Market adapting business models to an economy more and more driven by management of information, and taking stock of the vast amounts of information owned by banks, to be exploited for the business and operational benefit of the organization. We also aim to cove security concerns, exploit the potential of mobile and social networking technologies in banking and insurance, while complying with regulations.

### Values

We value the analysis of large amounts of information to derive intelligence for improved operational efficiency and competitiveness. We also pay attention to security in cloud computing and privacy-enhancing technologies and advanced cryptography approaches.

### Projects

Title	Project Title	Funding	Description
<b>FINSEC</b> <a href="http://www.finsec-project.eu">www.finsec-project.eu</a>	Integrated Framework for Security of Financial Infrastructures	H2020	Integrated, intelligent, collaborative and predictive approach to the security of critical infrastructures in the financial sector



Pedro Soria  
Head of Sector



**Labs**



# Advanced Parallel Computing

## Enabling future parallel applications



### Mission

Our main objective is to enable the usage of this technology to optimize resources management by assigning adequate resources to the applications and dealing with non-functional aspects; facilitate access to resources, thanks to frontends which hide the complexity of HPC; create and adapt new tools able to use the parallel computation capabilities, especially in the field of parallel (real-time) data analytics; and research on new ways to perform parallel computation.

### Vision

We are working towards the development of technologies of Exascale Computation for optimal resources management which enables the use of highly scalable applications avoiding bottlenecks while managing heterogeneous systems with accelerators; easing the use of HPC for different domains with tools for large and complex data analytics and parallelizing data processing to ease execution of experiments with a transparent access to HPC; and researching on future technologies such as New Quantum Computing and Future Neuromorphic Computing solutions.

### Values

We specialize in solving current issues when using HPC, and enabling the use of future exascale systems for smart orchestration of applications looking at several aspects (profiles, data movement, resources status, etc.), deriving some tasks to Cloud HPC resources whenever necessary; provision of front-ends for easy access and usage of HPC resources, integrating data management tools, experimentation tools, etc; and the development of the parallel Complex Event Processing engine for real-time data analysis, also available for low-power computing devices.



Francisco Javier Nieto  
Head of Lab

### Projects

Title	Project Title	Funding	Description
<b>CLASS</b> <a href="http://class-project.eu">class-project.eu</a>	Edge and Cloud Computation: A Highly Distributed Software for Big Data Analytics.	H2020	Efficient distribution of big-data workloads along the compute continuum (from edge to cloud) while providing sound real-time guarantees on end-to-end data analytics responses
<b>CoeGSS</b> <a href="http://www.coegss-project.eu">www.coegss-project.eu</a>	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.
<b>EUXDAT</b> <a href="http://www.euxdat.eu">www.euxdat.eu</a>	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.
<b>Fortissimo2</b> <a href="http://www.fortissimo-project.eu">www.fortissimo-project.eu</a>	Mathematical modelling, simulation, and optimization for societal challenges with scientific computing	H2020	Bring HPC-as-a-Service to SMEs through a marketplace, validated through a series of experiments driven by SME's around their current needs, where non-HPC users are introduced to the technology with experts and HPC centers in fields like industry 4.0.
<b>HiDALGO</b> <a href="http://hidalgo-project.eu">hidalgo-project.eu</a>	HPC and Big Data Technologies for Global Challenges	H2020	Boost HPC-based simulations in global challenges, enabling the application and development of tools for agent-based simulations and HPDA, while applying AI techniques as a way to improve workflows and simulations which support decision making.
<b>MegaMart</b> <a href="http://megamart2-ecsel.eu">megamart2-ecsel.eu</a>	HPC and Big Data Technologies for Global Challenges	ECSEL	Scalable model-based framework for continuous development and runtime validation of complex systems.
<b>MSO4SC</b> <a href="http://www.mso4sc.eu">www.mso4sc.eu</a>	Mathematical modelling, simulation and optimization for societal challenges with scientific computing	H2020	Provision of an elnfrastructure 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.
<b>STAMP</b> <a href="http://www.stamp-project.eu">www.stamp-project.eu</a>	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.
<b>SUPERSEDE</b> <a href="http://www.supersede.eu">www.supersede.eu</a>	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.



# Cybersecurity

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



### Mission

Our mission is to coherently address cybersecurity from a technological perspective keeping a holistic approach in mind (considering people, processes, and technology), in an effort to ensure innovation in the field of cyber incidents detection, impact assessment and response, by providing effective, intelligent, usable and context-aware solutions, for ensuring the security of citizens and organizations from threats such as cybercrime and cyber terrorism, while respecting fundamental rights, such as privacy.

### Vision

We envisage positioning Atos as one of the top 5 cybersecurity companies worldwide, working on a combination of multi-layered and integrated cybersecurity solutions, user education and awareness supported by processes, best practices, and governance as a way to prevent, mitigate and remediate cyber-attacks. With this vision in mind, we address existing and future challenges regarding security in areas, such as IoT, Critical Infrastructures, 5G networks, shared service applications, Cloud infrastructures, AI, Social Networks, risk assessment, digital forensics, training, among many others.

### Values

We focus our research on three main aspects: usability, intelligence, and automation.

Usable security is at the very core of the innovation. To this regard, our assets provide accurate information to each decision maker in the organization to guide security analysts in this process.

In terms of intelligence, we are including technologies such as AI and Machine Learning in the cybersecurity arena with the objective of making the solutions capable of comprehending the relationships between different observations in an enterprise environment and to identify behavioral models for every element of the organization.

We have been developing the concept of security automation when possible across tools and processes to avoid the use of manual intervention as much as possible, which, combined with the other two values, makes it possible to achieve an intelligence-driven cyber defense.



Rodrigo Díaz  
Head of Sector

### Projects

Title	Project Title	Funding	Description
<b>ANASTACIA</b> <a href="http://www.anastacia-h2020.eu">www.anastacia-h2020.eu</a>	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.
<b>CIPSEC</b> <a href="http://www.cipsec.eu">www.cipsec.eu</a>	Enhancing critical infrastructure protection with innovative security framework	H2020	A unified security framework that orchestrates state-of-the-art heterogeneous security products to offer high levels of protection for Critical Infrastructures.
<b>COMPOSITION</b> <a href="http://www.composition-project.eu">www.composition-project.eu</a>	Ecosystem for collaborative manufacturing processes	H2020	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.
<b>CYBERWISER.EU</b> <a href="http://www.cyberwiser.eu">www.cyberwiser.eu</a>	Civil Cyber Range Platform for a novel approach to cybersecurity threats simulation and professional training	H2020	Building on a 3-year legacy brought by its predecessor WISER, aims to become the EU's reference, authoritative, independent cyber range platform for professional training.
<b>DEFEND</b> <a href="http://www.defendproject.eu">www.defendproject.eu</a>	Data Governance for Supporting GDPR	H2020	Platform which empowers organizations in different sectors to assess the compliance status, plan the achievement of the GDPR compliance.
<b>DISIEM</b> <a href="http://disiem-project.eu">disiem-project.eu</a>	Diversity enhancements for security information and event management	ECSEL	Enhance existing SIEM systems 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.
<b>EUNITY</b> <a href="http://www.eunity-project.eu/en">www.eunity-project.eu/en</a>	Cybersecurity and privacy dialogue between Europe and Japan	H2020	Dialogue between Europe and Japan on cybersecurity and privacy research and innovation trends and challenges to foster and promote cybersecurity activities in both regions.
<b>FINSEC</b> <a href="http://www.finsec-project.eu">www.finsec-project.eu</a>	Integrated Framework for Security of Financial Infrastructures	H2020	Integrated, intelligent, collaborative and predictive approach to the security of critical infrastructures in the financial sector
<b>SerIoT</b> <a href="http://seriot-project.eu">seriot-project.eu</a>	Secure and safe Internet of Things	H2020	Open & reference framework for real-time monitoring of the traffic exchanged through heterogeneous IoT platforms within the IoT network in order to recognize suspicious patterns.
<b>SMESEC</b> <a href="http://smesec.eu">smesec.eu</a>	Cybersecurity for small and medium-sized enterprises	H2020	Cost-effective suite of cyber-security tools to support SMEs in managing network information, security risks and threats.
<b>STOP-IT</b> <a href="http://stop-it-project.eu">stop-it-project.eu</a>	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.
<b>THREAT-ARREST</b> <a href="http://www.threat-arrest.eu">www.threat-arrest.eu</a>	Cyber Security Threats and Threat Actors Training	H2020	Advanced training platform incorporating emulation, simulation, serious gaming, and visualization capabilities to adequately prepare stakeholders with different characteristics.
<b>YAKSHA</b> <a href="http://project-yaksha.eu">project-yaksha.eu</a>	Cybersecurity Awareness and Knowledge Systemic High-level Application	H2020	Reinforcing EU-ASEAN cooperation in the cybersecurity domain by developing a solution tailored to the specific user and national needs, leveraging EU Know-How and local expertise.



# Identity & Privacy Lab

## Securing corporate & personal identity in cyberspace



### Mission

Our mission focuses on the provision of key enablers for trust and security as secure identity management schemes and trust-enabling services in compliance with regulatory frameworks such as GDPR, eIDAS, NIS, among others, that will allow the delivery of assets and trustworthy solutions suitable for Atos customers in different vertical markets, fostering competitive advantages in an increasingly complex and distributed environment with multiple state-of-art technologies, over heterogeneous digital services value chains.



Alberto Crespo  
Head of Lab

### Vision

Secure identity and privacy technologies are key enablers of Trust as a fundamental condition for citizens to interact safely in our Digital Society and for businesses addressing Digital Transformation / Industry 4.0, in full alignment with European policy on cybersecurity and the development of the Digital Single Market. In a context of increased cyber threats, including different forms of identity-related crimes, we 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.

From a business perspective, 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.

### Values

We work with a wide range of end-users who have validated over time our solutions in many different areas, from cross-border and cross-sectoral identity management for digital public and private services (and which has been the basis of highly influential Regulations such as eIDAS), to highly secure sensitive data assets protection in eHealth to unique capabilities and know-how in smart border control management or user-centric identity management solutions valid both for mobile and cloud-based environments.

Our unique selling proposition focuses on electronic identity management and advanced personal data protection solutions where we act as technology providers, integrators and consultants for verticals in public and private sectors.

### Projects

Title	Project Title	Funding	Description
<b>ABC4EU</b> <a href="http://abc4eu.com">abc4eu.com</a>	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.
<b>ARIES</b> <a href="http://aries-project.eu">aries-project.eu</a>	Reliable European Identity Ecosystem	H2020	Comprehensive framework for reliable e-identity ecosystem to improve identity, trust and security, with better support to law enforcement.
<b>BigMedilytics</b> <a href="http://www.bigmedilytics.eu">www.bigmedilytics.eu</a>	Big Data for Medical Analytics	H2020, EINFRA	Enhancing patient outcomes and increase productivity in the health sector by applying Big Data technologies to complex datasets while ensuring security and privacy of personal data.
<b>CREATE-IoT</b> <a href="http://european-iot-pilots.eu/project/create-iot">european-iot-pilots.eu/project/create-iot</a>	Cross fertilisation through alignment, synchronisation and exchanges for IoT	H2020	Stimulating collaboration between IoT initiatives, foster the take up of IoT in Europe and support the development and growth of IoT ecosystems based on open technologies and platforms.
<b>CREDENTIAL</b> <a href="http://credential.eu">credential.eu</a>	Secure cloud identity wallet	H2020	Innovative cloud-based services for storing, managing, and sharing digital identity information relying on the combination of strong hardware-based multi-factor authentication with end-to-end encryption.
<b>ESMO</b> <a href="http://www.esmo-project.eu">www.esmo-project.eu</a>	eIDAS-Enabled Student MObility	Connecting Europe Facility (CEF)	Interoperable use of and uptake of CEF eID in Higher Education sector, especially in Spain, Norway, and Greece, promoting the broader development of cross-border activities.
<b>FENTEC</b> <a href="http://www.fentec.eu">www.fentec.eu</a>	Functional ENcryption Technology	H2020	Development of new Functional Encryption (FE) as an efficient alternative to the all-or-nothing approach of traditional encryption.
<b>LEPS</b> <a href="http://www.leps-project.eu">www.leps-project.eu</a>	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.
<b>LIGHTest</b> <a href="http://lightest.eu">lightest.eu</a>	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.
<b>PAPAYA</b> <a href="http://www.papaya-project.eu">www.papaya-project.eu</a>	Platform for Privacy-preserving Data Analytics	H2020	Addressing the privacy concerns when data analytics tasks are performed by untrusted third-party data processors with the design and development of dedicated privacy-preserving data analytics modules.
<b>PRISMACLOUD</b> <a href="http://prismacloud.eu">prismacloud.eu</a>	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 cryptography.
<b>WITDOM</b> <a href="http://www.witdom.eu">www.witdom.eu</a>	Empowering privacy and security in non-trusted environments	H2020	Automatic and efficient privacy provisioning solutions, keeping data confidential in the untrusted environment, while the data owner can use the data in the encrypted domain.

# Next Generation Cloud

## Contributing to Atos innovation strategy with Cloud and Edge Computing



### Mission

Our goal is to contribute to Atos strategy with regards to Cloud computing and its novel forms such as Edge and [Swarm computing](#), for the development of new models and architectures that embrace resources increasingly available everywhere.

### Vision

Computing is today pervasive in all aspects of our life. In the longer term, computing will not be constricted to specific devices but will be virtually embedded and pervasive to everything, enabling an unprecedented computing continuum.

The capacity, size, and energy harvesting limitations of these devices will require novel computing and communication architectures beyond Edge and Cloud computing developments today embracing hardware heterogeneity and hyper-distribution of computing.

### Values

Our research encompasses topics as decentralization and over distribution of computing over Edge, Multi-Cloud and Hybrid Cloud environments; Edge and Fog workload Management and Across Edge execution orchestration; interoperability, standardization and heterogeneity exploitation; Edge Service Management; and novel areas of Application for Computing Continuum such as eco-systems of cyber-physical devices, edge, fog and cloud environments, each adding to the collective capability and insight.



Ana María Juan  
Head of Lab

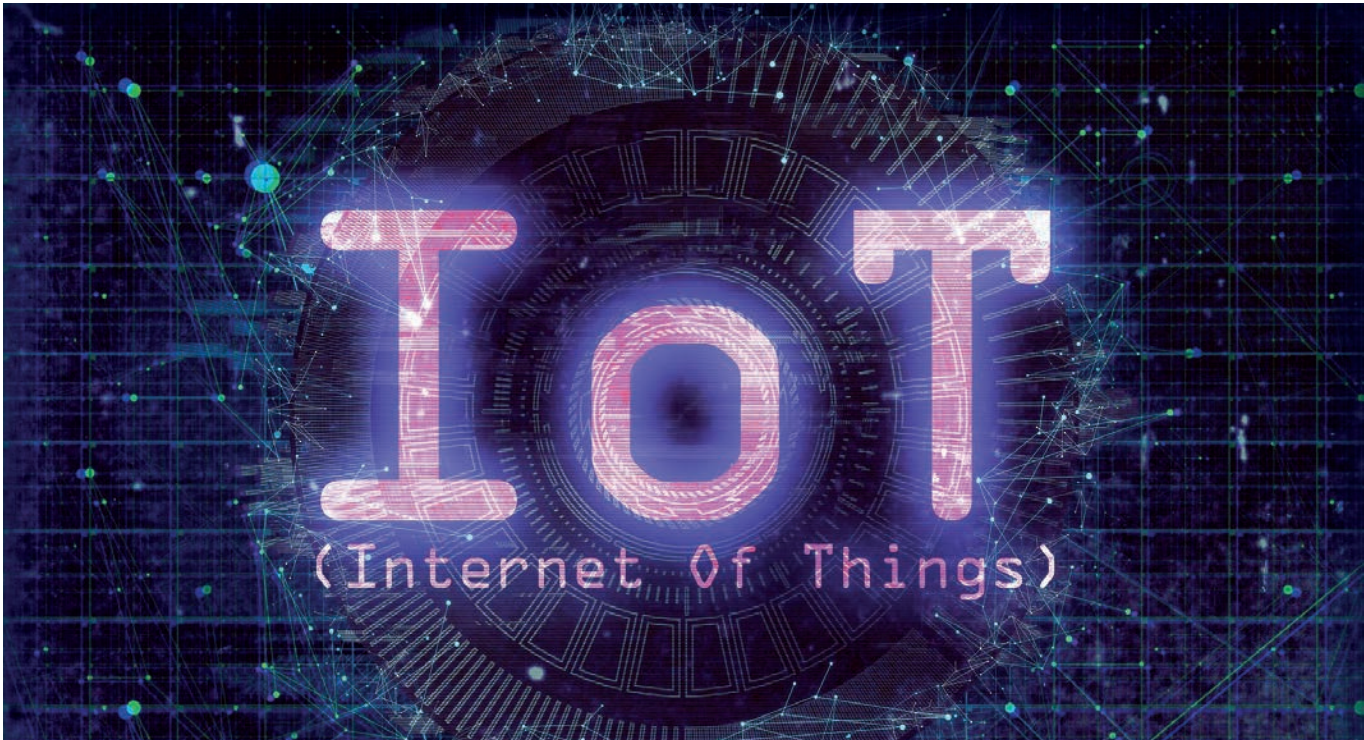
### Projects

Title	Project Title	Funding	Description
<b>AGILE</b> <a href="#">agile-iot.eu</a>	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.
<b>BASMATI</b> <a href="#">www.basmati.cloud</a>	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.
<b>BIGDATASTACK</b> <a href="#">bigdatastack.eu</a>	Holistic Stack for Big Data Applications and Operations	H2020	Offers a complete high-performant stack of technologies addressing the emerging needs of data operations and applications.
<b>CloudSocket</b> <a href="#">www.cloudsocket.eu</a>	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.
<b>DECENTER</b> <a href="#">decenter-project.eu</a>	Decentralised Technologies for Orchestrated Cloud-to-Edge Intelligence	H2020	Fog Computing Platform, covering the whole Cloud-to-Things continuum, that will provide application-aware orchestration and provisioning of resources, driven by methods of Artificial Intelligence.
<b>DITAS</b> <a href="#">www.ditas-project.eu</a>	Data-intensive applications improvement by moving data and computation in mixed cloud/fog environments	H2020	SDK and an execution environment to overcome the barriers that hamper the adoption of Cloud Computing and increase the adoption of Fog computing.
<b>Elastest</b> <a href="#">elastest.eu</a>	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.
<b>I-BiDaaS</b> <a href="#">www.ibidaas.eu</a>	Industrial-Driven Big Data as a Self-Service Solution	H2020	Unified solution that significantly increases the speed of data analysis and facilitates cross-domain data-flow towards a thriving data-driven EU economy
<b>INDIGO-DataCloud</b> <a href="#">indigo-datacloud.eu</a>	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.
<b>mF2C</b> <a href="#">www.mf2c-project.eu</a>	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.
<b>RAPID</b> <a href="#">www.rapid-project.eu</a>	Heterogeneous secure multilevel 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.
<b>symbloTe</b> <a href="#">symbiote-h2020.eu</a>	Symbiosis of smart objects across IoT environments	H2020	Fostering a simplified IoT application and service development process over interworking IoT platforms.
<b>TANGO</b> <a href="#">tango-project.eu</a>	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.



# Internet of Everything

## Making life easier from a complex IoE world Computing



### Mission

As a key actor in the European IoT research landscape, we provide technological contributions for some of the most challenging pillars of the IoE ecosystem, such as integration and interoperability of different IoT platforms; ensuring privacy, safety and security at all levels of the IoT stack for Cyber-Physical Systems (CPS) and Safety Critical Applications; providing “agile developments” and “continuous integration” methodologies for large-scale IoT environments; supporting the use of standards and open technologies; embracing the use of cutting-edge horizontal technologies like Blockchain and AI; and develop sustainable business embracing the full potential of the Internet of Everything.

### Vision

Our aim is to focus on the use of all the gathered data from the Second Phase of IoT, with the use of technologies, such as AI and Machine Learning that are suitable to be applied in IoT scenarios, for detecting patterns and inferring behaviors to expand the use and possibilities of businesses with valuable information, while not forgetting the importance of improving current IoT platforms, protocols and standards.

### Values

We work as a multidisciplinary technological team targeting IoT platforms, embedded systems, sensorized devices, communication protocols, different programming languages, mathematics / AI background, web technologies and the application of best practices for agile development and continuous integration, testing and deployment.



José Gato  
Head of Lab

### Projects

Title	Project Title	Funding	Description
<b>AGILE</b> <a href="http://agile-iot.eu">agile-iot.eu</a>	Adaptive gateways for diverse multiple environments	H2020	MModular hardware and software gateway for IoT with support for protocol interoperability, device and data management, apps execution, and external Cloud communication.
<b>CREATE-IoT</b> <a href="http://european-iot-pilots.eu/project/create-iot">european-iot-pilots.eu/project/create-iot</a>	Cross fertilisation through alignment, synchronisation and exchanges for IoT	H2020	Stimulating collaboration between IoT initiatives, foster the take up of IoT in Europe and support the development and growth of IoT ecosystems based on open technologies and platforms.
<b>FI-NEXT</b> <a href="http://www.fiware.org">www.fiware.org</a>	Bringing FIWARE to the next step	H2020	Bringing FIWARE from a European Open Source project to a global Open Source Community, and ensuring that it meets the highest quality standards and best technical support.
<b>SecureIoT</b> <a href="http://secureiot.eu">secureiot.eu</a>	Predictive Security for IoT Platforms and Smart Objects	H2020	Securing the next generation of dynamic, decentralized IoT systems, which spans multiple IoT platforms and networks of smart objects, through implementing a range of predictive IoT security services.
<b>SerIoT</b> <a href="http://seriot-project.eu">seriot-project.eu</a>	Secure and Safe Internet of Things	H2020	Open & reference framework for real-time monitoring of the traffic exchanged through heterogeneous IoT platforms within the IoT network in order to recognize suspicious patterns.
<b>Synchronicity</b> <a href="http://synchronicity-iot.eu">synchronicity-iot.eu</a>	The global IoT market for cities	H2020	Horizontal smart city solution which can be replicated and instantiated in different cities and a hub of city services interoperable among them.
<b>VICINITY</b> <a href="http://www.vicinity2020.eu/vicinity">www.vicinity2020.eu/vicinity</a>	Open virtual neighborhood network to connect IoT infrastructures and smart objects	H2020	Bottom-up ecosystem of decentralised interoperability of IoT infrastructures called virtual neighborhood, where users can share access to their smart objects without losing control over them.



# Data Intelligence

## AI and Big Data: Getting value and intelligence from data



### Mission

We focus on the application of AI and Big Data technologies to real scenarios where the innovation is fundamental to contribute to a data-driven society powered by the massive amounts of data available today through multiple devices and locations such as mobiles, homes, cities, cars, etc. These set of technologies pose not only technical but also societal and ethical issues.:

- Artificial Intelligence: Machine Learning and Deep Learning to enable multiple applications to real-world scenarios.
- Big Data: Covering most of the technical aspects of the Data Value Chain to get value from the data. The use of blockchain to enable secure data sharing is one of our key research lines.
- Semantics: Application of Knowledge Graphs and Linked Data as enablers for AI.

### Vision

Our main vision is to carry out research on AI-guided by strong ethical principles, to avoid the misuse of AI and Big Data, and ensure data privacy and auditability while enabling the use of the technology. In this sense, Blockchain technology is also being integrated as an enabler to break data silos.

From the technical perspective, the Lab is developing services to easily define and deploy big data and machine learning frameworks and algorithms on demand (especially useful for data scientist and SMEs), with the combination of cloud and edge analytics, as well as Big Data Benchmarking solutions which recommend and deploy the right tool for benchmarking their applications and Big Data services.

### Values

Our Lab provides a unique point of contact with the R&D carried out in the Big Data and AI fields in Europe through our participation in the Big Data Value Association and lighthouse AI projects, in particular by developing assets that allow deploying and configure Big Data frameworks, ML libraries, and algorithms; [analyze social networks](#); search and recommend Big Data tools; and enable data sharing using a Blockchain approach.

Knowledge in these fields makes the Lab a key driver in the research of new ways to empower companies in their digital transformation while keeping ethical values at their forefront.



Tomás Pariente  
Head of Lab

### Projects

Title	Project Title	Funding	Description
<b>ACANTO</b> <a href="http://www.ict-acanto.eu">www.ict-acanto.eu</a>	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.
<b>BDVe</b> <a href="http://www.big-data-value.eu">www.big-data-value.eu</a>	Big Data Value Ecosystem	H2020	Support the Big Data Value PPP in realizing a vibrant data-driven EU economy and contribute to the implementation of the PPP.
<b>BigMedilytics</b> <a href="http://www.bigmedilytics.eu">www.bigmedilytics.eu</a>	Big Data for Medical Analytics	H2020	Enhancing patient outcomes and increase productivity in the health sector by applying Big Data technologies to complex datasets while ensuring security and privacy of personal data.
<b>BodyPass</b> <a href="http://bodypass.eu">bodypass.eu</a>	API-ecosystem for cross-sectorial exchange of 3D personal data	H2020	Aims at fostering exchange the of 3D data assets from two sectors, by adapting and creating tools to allow secure exchange of information between data owners, companies and subjects (patients and customers).
<b>CrowdHEALTH</b> <a href="http://www.crowdhealth.eu">www.crowdhealth.eu</a>	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.
<b>DataBench</b> <a href="http://www.databench.eu">www.databench.eu</a>	Evidence Based Big Data Benchmarking to Improve Business Performance	H2020	Design of a benchmarking process helping European organizations developing Big Data Technologies to reach for excellence and improve their business performance.
<b>QROWD</b> <a href="http://qrowd-project.eu/project">qrowd-project.eu/project</a>	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.
<b>TOREADOR</b> <a href="http://www.toreador-project.eu">www.toreador-project.eu</a>	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.



A person in silhouette is walking away from the camera down a long, narrow corridor. The corridor is lined with glowing blue rectangular frames that recede into the distance, creating a strong sense of perspective. The ceiling and walls are dark, and the overall atmosphere is futuristic and mysterious.

**Research Lines**



# Computer Vision

## From Gabor filters to Deep Neural Networks, modelling the visual cortex

### Description

Our main objective is to provide the visual and cognitive abilities of human beings to artificial systems. To this end, Computer Vision methods and algorithms rely on modeling how the human visual cortex interprets images and videos sequences.

Through the identification of the objects in an image, their dimensions and relative position to the camera, Computer Vision is capable of extracting characteristics of the objects or people. Such analysis allows to subsequently identify objects and persons as well as to interpret the actions that occur in the scene.

Relation to current **technological trends**:

#### Classic Computer Vision algorithms:

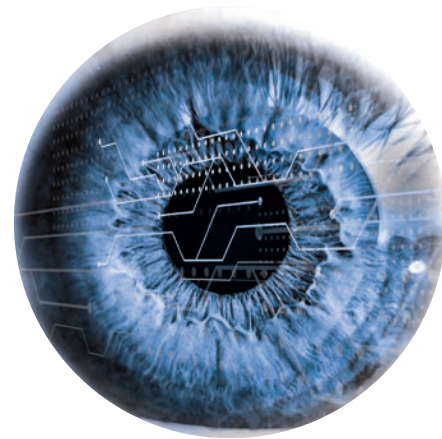
Study and development of classical computer vision algorithms in time and frequency domain to develop an easy to use a structured framework of algorithms and image analysis tools, optimized for the deployment of solutions with high scalability.

**Deep Neural Networks:** The emergence in recent years of high-capacity hardware devices such as GPUs has allowed an unprecedented development of algorithms belonging to the family of artificial neural networks. We specialise in the use of different neural network architectures as they are the algorithms that best model the functioning of perceptual processes in the human visual cortex. This approach to image analysis processes allows us to address tasks such as

- Classification of objects and identification of context in images.
- Recognition of temporal patterns, human action identification.
- Segmentation.
- Movement modeling.
- Person recognition through the classification of biometric characteristics.
- Re-identification of objects or people in video sequences.

**Security in deep learning systems** – The advent of deep learning systems and its increasing exposure to online services in a wide variety of applications (Classification of Youtube videos, recommendation of products in online sales platforms, facial recognition for banking or other services, video surveillance systems, etc) raises concerns regarding the security of neural networks. New types of attacks have been detected, like adversarial image which combines actual images with noise pattern that deceive the deep

learning system. This kind of attacks are becoming trendy in recent times and poses a real threat to AI technology-driven services. The Computer Vision Research Line gets into the different techniques of attack, exploring their characteristics and researching possible countermeasures and defense strategies. combines actual images with noise pattern that deceive the deep learning system. This kind of attacks are becoming trendy in recent times and poses a real threat to AI technology-driven services. The Computer Vision Research Line gets into the different techniques of attack, exploring their characteristics and researching possible countermeasures and defense strategies.



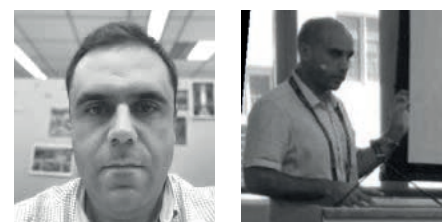
### Critical Mass / Market

- Strong proficiency in deep learning classification and prediction methods as well as in feature detection and matching.
- Deep learning models for early diagnosis of Alzheimer disease. Based on neuropsychological tests and the neuro-image acquisition system, the vision algorithm provides a better clinical diagnosis of neurodegenerative disorders by identifying the first cognitive signs images obtained from Positron Emission Tomography (PET).
- Tools to identify and track unauthorized vehicles through UAVs onboard cameras, and detect potential threats by analyzing people gestures near critical areas ([ZONESEC](#) project)
- Facial recognition algorithms with a statistical module to reduce the rate of false positive, minimizing the number of parameters to set up ([BODEGA](#) project)
- Tools for the emotion detection and sentiment analysis of people including the heart rate monitoring ([PERSONA](#) project)
- Feature matching detection from UAVs onboard cameras to inspect pipeline integrity and anticipate maintenance needs (e-Fly project)

### Relation with Atos Portfolio

Market [foresight reports](#) highlight that Computer Vision technologies will undergo steady growth in the coming years. Moreover, deep learning and Computer Vision are a key product differentiator technology when embedded into existing solutions, and this last technology encompasses within the Artificial Intelligence trends which is one of the main growth pillars of Atos.

Although Computer Vision technology can provide support to a wide variety of markets, we focus on Homeland Security sector customers due to their increasing demands of biometrical identification and tracking of persons. As a result, different implementations of the facial recognition systems were integrated into Atos portfolio.



José María Miranda Raúl Sevilla

# Intelligent Autonomous Robots and Systems

## Bringing revolutionary benefits to society, while facing important societal challenges

### Description

Our Research Line coordinates the R&D activity related to autonomous systems and intelligent automation technologies, their application in specific vertical markets, and their relation to other technologies.

The **challenges** addressed, and current **technological trends** are:

- **Adaptive Systems** – Biologically-inspired and bottom-up approach to AI and the kind of intelligent behavior emerging from the interaction of an embodied agent within a dynamic uncertain complex environment.
- **Autonomous Systems** – Decisional autonomy, situational awareness and action selection in cyber-physical systems spanning from wheeled robots to drones, taking behavior-based robotics (reactive planning) approach.
- **Cognitive Robotics** – Inspired on Cognitive neuroscience for bringing more engineered and symbolic (top-down) approaches to AI and address with guarantees, challenges such as human-robot interaction and social robotics.
- **Development and Epigenetic Robotics** – Exploit and combine concepts and methods such as self-organization, collective intelligence, deep learning and reinforcement learning, for agents which acquire (implicit) knowledge from its experience in continuous interaction with the environment.
- **Robotic Systems Development** – Combination of traditional software and systems engineering concepts, methods and tools with new AI systems development ones, especially on MBSE (Model-Based Software Engineering), for successful design, construction, verification and validation of real-world autonomous cyber-physical systems.
- **Robot and Robotic System Safety** – Robot ethics, safety by design and human-robot interaction safety; specifically, on affective mechanisms to embed safety guarantees in intelligent autonomous systems for operation in proximity to and/or in collaboration with humans.

### Critical Mass / Market

**AI-based Cyber-Physical Systems (CPS).** Intelligent Robotics Systems, interact with the physical world to attain a goal, connected to their environment through the IoT, and getting unlimited computational, data and networking resources from the cloud. Assuring the autonomy of those systems (correctness, robustness, reliability, safety, etc.) is addressed in the e-FLY project. (See Computer Vision Research Line).

**Cloud Robotics and Decentralized AI.** AI-based CPS designers and vendors are under pressure to provide increasingly intelligent behavior at competitive costs. Increasing on-board computation of robots raises their costs and energy demand while reducing autonomy. Cloud Robotics' aim is to bring cloud technologies in terms of processing power, storage and services to extend robots capabilities. Even if powerful, drawbacks recognized for Cloud robotics approach relate to the lack of adequacy for tasks requiring real-time processing, low latency and the requirement for continuous internet connectivity. AI decentralization strategies, such as edge computing, have emerged to address these drawbacks, as it can be seen in the DECENTER project.

**Robot Safety.** Designing CPS for operation in proximity to and/or in collaboration with humans means that current safety engineering and legal mechanisms need to be revisited to ensure that individuals –and their properties– are not harmed. Atos is working with the embodied cognition and affective computing communities in AI to embed trust and safety mechanisms in autonomous robots to ensure robots remain safe-operational in dynamic, complex and unpredictable environments.



### Relation with Atos Portfolio

Our Research Line contributes to shaping the future of Atos Industry 4.0 and IoT offering. It envisions intelligent autonomous systems and robots that streamline real-world operations in a wide range of industries by means of real-time automated data-driven decisions and actions.



Orlando Ávila



## Developing bioinformatics tools for genomics analysis

### Description

Massive genomics and the generation of biomedical data are producing a large amount of data that has led into Bioinformatics, which is a multidisciplinary field involving computer science, mathematics, biomedicine and, statistics, with the aim of processing, analyzing and extracting knowledge.

Bioinformatics is opening many possibilities for the development of multiple fields. We are working with several technologies and technological trends, such as:

- Cloud Computing and Big Data to provide scalable infrastructures for managing massive amounts of genomic data.
- HPC for the execution of complex biological models.
- Artificial Intelligence and Machine Learning:
  - Markov's hidden models for DNA / RNA sequencing
  - Bayesian Neural Networks, Deep Neural Networks for recognition and classification of partners
  - Support vector machines for classification of disease/patient/ case
  - K-means and other grouping algorithms for grouping/grouping
  - Algorithms based on fuzzy logic for gene sequencing
  - Text mining for data annotation

### Critical Mass / Market

Bioinformatics has multiple applications in the domains of medical research, microbial genome, antibiotic resistance, molecular/ precision/personalize medicine, gene therapy, drug development, waste/cleanup biotechnology, agriculture, aquaculture, farming, veterinary and insect resistance, among others.

### Relation with Atos Portfolio

Atos Portfolio is being strengthened by the research on Bioinformatics and the development of tools developed in European Projects focusing on biomedicine as a result, we bring:

Expertise in R, Python, Matlab, Octave, among others for genomics analysis

- Expertise in the biomedicine domain.
- Partners network in the biomedical community.
- Shifting to big data/cloud paradigm.



Manuel M. Pérez

## Linking innovation with distributed ledger technologies

### Description

Our aim is to coordinate ARI research activity related to distributed ledger technologies, be it research on the technologies themselves, improvements, linking with other technologies, or research about applications of blockchain in specific vertical markets, or in relation to other technologies or solutions.

We act as a reference point by identifying, tracking and monitoring all blockchain activities being carried out under the umbrella of ARI; providing resources, technical support, and advice to all initiatives involved in distributed ledger technology; and being the main contact point regarding blockchain activities in ARI toward ARI partners in H2020 projects.

### Critical Mass / Market

In [Gartner's Hype Cycle for Emerging Technologies 2018](#), blockchain technology is about to enter the third phase of the cycle: the "Trough of Disillusionment" which provides the technology a maturity level where it's widely understood, surviving the products and initiatives really worthy and placed beyond the initial hype of the early adopters.

The plateau of productivity will be reached in 5 to 10 years when the technology becomes mainstream enough to pay off market applicability and relevance.

### Relation with Atos Portfolio

According to Gartner insights, new business, social and technological models are to be expected and we must be prepared to understand the implications of exploiting blockchain technologies, and is in our hand the development and the model of this flourishing technology in Atos products, solutions, and industries that conform our portfolio.

Atos portfolio solutions, products, and industries with strong links and potential relations with distributed ledger technologies are::

- Products: AI, Cybersecurity, Defence and Mission Critical, Enterprise servers, HPC, Integrated Systems, Data Center Applications and Transformation, Quantum Learning Machine
- Solutions: Application Transformation

and Management, Business Accelerators, Canopy Orchestrated Hybrid Cloud, CODEX, Insight-driven Outcomes, Digital Transformation Factory, Digital Workplace, Syntel, Automation and Robotics, Digital Customer Experience, Digital Payments, e-Transactions, Industry 4.0, among other key solutions

- Industries: Aerospace, Automotive, Banking, Central Government, Chemicals, Consumer packaged goods, Defence, Discrete Manufacturing, Education, Energy, Healthcare, Hospitality, Insurance, Life Sciences, Local Government and Cities, Media, Retail, Sport and Major Events, Telecom, Transport, and Utilities



Ignacio González Fernández

Living in a spatially-enabled world

Description

Our work is related to current technological trends, such as:

- **Cloud computing, Big Data, and HPC**
  - 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
  - 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 ((Geo) Pandas, SciPy, (Geo) 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 (e.g. OGC, INSPIRE, GEOSS, ORCHESTRA)
- 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 (e.g. Spanish Ministry of Environment and Agriculture) with FOODIE, ENVIROFI, DataBio, EUXDAT and EO4AGRI projects
  - Development of Climate Service solutions in support of decision-makers and infrastructure (urban and transport) planners with CLARITY project
  - Support to the improvement of Copernicus programme capabilities for the Agriculture domain (and in particular CAP-2020 policy) through the Coordination and Support Action EO4AGRI project



Miguel Ángel Esbrí



Improve your productivity, release better quality software

Description

Our aim is focused on researching several technologies in the framework of Software Development to support the work of Sectors and Labs within ARI.

We specialise in the development of different techniques and methods regarding software development and management of complex software systems for Model Driven Software Engineering (Design-Time), Software Modeling and Simulation (Run-Time), Aspect-Oriented Software Engineering/Modeling, DSL based software modeling and development, Vector Programming/Parallel Programming, Advanced User Interface, Run-time dynamic adaptation, OSS Community Development, Choreography Service Composition, Search-based software engineering and architectures, Enterprise Application Integration, Automation Techniques, Test Driven Development, Test Amplification, and Quantum Computing.

Critical Mass / Market

With the aim of providing the European Industry with efficient services and software infrastructures to improve flexibility, interoperability, and quality, our Research Line works close to main referents in software development such as NEXOF Software Engineering, Software Engineering Cluster, and NESSI.

Relation with Atos Portfolio

Our work contributes to strengthening our delivery on European Projects and supporting the portfolio of Atos with the development of cutting-edge technologies.

Some main assets we have worked with are:

- 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 Gorroño Goitia





**Strategic Projects**





# MIDIH 4.0

## Manufacturing Industry Digital Innovation Hubs

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.

### 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.

### 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.

Web	<a href="http://midih.eu">midih.eu</a>
Budget	8,524,833 €
Funding	7,999,158 €
Date	Oct 2017
Coordinator	EIT Digital
Contact	<a href="mailto:jorge.rodriquez@atos.net">jorge.rodriquez@atos.net</a>



# inteGRIDy

inteGRIDy integrates cutting-edge technologies, solutions and mechanisms in a scalable cross-functional framework of replicable solutions to connect existing energy networks with diverse stakeholders

### Challenges

The InteGridy project aims at integrating cutting-edge technologies, solutions and mechanisms in a scalable Cross-Functional Framework 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).

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.

Web	<a href="http://www.integridy.eu">www.integridy.eu</a>
Budget	1,584,028 €
Funding	1,232,901 €
Date	Jan 2017
Coordinator	Atos Spain
Contact	<a href="mailto:andrea.rossi@atos.net">andrea.rossi@atos.net</a>





# ABC4EU

## Automated border control gates for Europe

### Challenges

People travel and migrate. International movement is on the rise and so are the numbers of border crossings each year, too. In 2011 alone, there were over 700 million border crossings, and estimates predict that there will be an 80 % increase by 2030. Border crossings should be made as smooth and rapid as possible for travellers without compromising security. This would benefit both states and passengers if the Border Control Processes were automated and harmonized, i.e. uniform across Europe.

The project addressed challenges such as making border checks more flexible for passengers, facilitating the border crossing process for 3rd country passengers while maintaining security at the border, updating and integrating current ABC systems, assessing the Feasibility of National Facilitation Programme (NFP) and Entry/Exit System (EES), defining the concept for the inclusion of Border Crossing Points (BCPs) into an Integrated Border Management System at different levels, and assessing the compliance of proposed processes with legal requirements.

### Value Proposition

During the last years, many ABC Gates have been deployed in the main European airports, most of them as pilot projects intended to test their capability to improve the border crossing processes in aspects such as speed, security, automation, false rejection reduction, etc. The experience gained from these pilots has been periodically assessed within the Frontex ABC Workshops, where the need for a harmonized approach has been specifically addressed as one of the most urgent issues to be solved in areas as e-passports management, biometrics, gate design, human interface, processes, PKD certificate exchange, signalling and interoperability. In full alignment with 2016 proposal for [Smart Borders](#), ABC4EU has developed and piloted EES, NFP, eGate and mobile border control solutions piloted at large scale in Spain, Portugal and Romania.

Atos has acquired extremely valuable direct integration expertise for a real-life scenario Piloted NFP, EES and Mobile system in real conditions with real Border Guards and real travellers at Madrid International Airport, Algeciras Port and Romanian-Bulgarian border. Furthermore it has built a strong working relation with key players in borders management arena: technology providers, integrators, end-users (in particular Spanish National Police and Police Bodies from other EU countries), also with a deep knowledge of Smart Borders package (EES and Schengen Borders Code Regulation) and EU-LISA pilots, Frontex guidelines as well as integration know-how with national law enforcement systems.

### Outcomes

A major outcome developed by Atos is a Smart Borders Mobile System (SBMS) that follows the Smart Border EES and Schengen Border Code workflow for processing of a short stay Third Country Nationals, EU/EEA/CH, and Electronic Residence Permit Travellers, that features SBMS App with Front End Gateway, Full EES and Schengen verification workflow, biometric fusion, among many others that has been field tested to read well passports from 19 EU countries, 5 American countries, and 3 African countries.

Web	<a href="http://www.abc4eu.com">www.abc4eu.com</a>
Budget	16,800,000 €
Funding	11,760,000 €
Date	Jan 2014
Coordinator	Indra Sitems S.A.
Contact	<a href="mailto:alberto.crespo@atos.net">alberto.crespo@atos.net</a>

### Business Impact

Business value is generated by commercial opportunities with EU and National Law Enforcement bodies thanks to key Atos outcomes:

- Desktop client solution and server-side components for National Facilitation Programme and for enrolment in NFP and EES
- Mobile client app integrated with COTS solution for portable border crossings checks implementation
- Security expertise for end-to-end secure solutions

The Atos SBMS Solution and asset provides multiple benefits to enhance border security with convenience for Border Guards and Travellers, providing traveller document and person verification anywhere anytime thanks to its mobility and designed in compliance with latest Smart Borders EU Package and is integrated with strong security features with border control national and EU backend systems for real-time checks, with flexibility to be deployed for use on trains, buses, ferries, cruise ships, etc. The solution it is able to read ICAO ePassports of any generation, electronic Residence Permits and NFC-compatible eIDs with verification of chip and machine-readable zones to detect tampered documents, also sending to backend verification systems (e.g. Visa Information System) high quality capture of fingerprints in NIST package standard format.

Atos prototypes include measures to satisfy stringent data protection requirements in compliance with applicable regulatory framework and following ethical guidelines within ABC4EU consortium.



# CIPSEC

## Enhancing Critical Infrastructure Protection with innovative SECurity framework

### 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.

Web	<a href="http://www.cipsec.eu">www.cipsec.eu</a>
Budget	7,017,235 €
Funding	5,258,316 €
Date	May 2016
Coordinator	Atos
Contact	<a href="mailto:rodrigo.diaz@atos.net">rodrigo.diaz@atos.net</a>

### 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).



# EO4wildlife

## Protection and conservation of wildlife

PLATFORM FOR WILDLIFE MONITORING INTEGRATING COPERNICUS AND ARGOS DATA

### 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 linked 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	<a href="http://www.eo4wildlife.eu">www.eo4wildlife.eu</a>
Budget	2,665,325 €
Funding	2,665,325 €
Date	Jan 2016
Coordinator	Atos
Contact	<a href="mailto:jose.lorenzo@atos.net">jose.lorenzo@atos.net</a>



# HEARTMAN

## Personal Decision Support System for Heart Failure Management

MONITORING PHYSICAL AND PSYCHOLOGICAL STATE

### 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.

In the European project CHIRON, heart failing patients in two countries were telemonitored to gather a unique dataset consisting of 17 parameters characterizing HF patients' short-term health and environment. Due to the reluctance of severely sick patients (among whom deaths and hospitalizations are likely) to participate in the study, patient-reported outcomes were used instead - specifically how the patients perceive their health. This is very much in line with the recent trends in medicine that stress the importance of patient participation and their quality of life. The CHIRON data was used to build models that can predict how a patient will perceive his/her health based on parameters such as daily exercise, humidity, heart rate, etc. Many of these parameters can be controlled, so the CHIRON predictive model is suitable as a basis for a Decision Support System (DSS) that can provide day-to-day advice to patients..

### 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.

Web	<a href="http://www.heartman-project.eu">www.heartman-project.eu</a>
Budget	3,325,050 €
Funding	3,325,050 €
Date	Jan 2016
Coordinator	Jožef Stefan Institute (Coordinator) Atos (Technical Coordinator)
Contact	<a href="mailto:carlos.cavero@atos.net">carlos.cavero@atos.net</a>

### 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.





# MATHiSiS

Make learning more personalized - create upon your needs, be active and engaged, measure the progress!

### 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, such as the need for 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 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, tutors, and caregivers by creating a novel and continuously adaptable “robot/machine/computer” with human interaction ecosystem to enhance vocational training, workplace learning and mainstream education for individuals with or without learning disabilities.

### Value Proposition

MaTHiSiS product-ecosystem 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 adaptive learning, automatic feedback, automatic assessments of learner’s progress and behavioural state, affective learning, and game-based learning. The 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.

Within the project, 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, and 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..

### Outcomes

The outcome consists of an integrated multi-agent interactive platform that will guide the deployment of the users’ learning activities, with an educational scheme 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, which constitutes a core component of the MaTHiSiS system including four crucial subsystems that create an innovative smart learning ecosystem:

- Experience and graph-based interactive storytelling engine that generates interactive content
- Learning graph engine based on learner’s behaviour and interaction
- Decision Support System (DSS) providing and collecting learning analytics and controlling synchronous and asynchronous interaction between devices
- Profile Repository to store collected data and learning graphs for learners profile

In addition, a set of Smart Learning Atoms (SLA) is going to be created for defined use cases, and 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.

Web	<a href="http://www.mathisis-project.eu">www.mathisis-project.eu</a>
Budget	7,621,085 €
Funding	6,531,895 €
Date	Nov 2016
Coordinator	Atos Spain
Contact	<a href="mailto:ana.pinuela@atos.net">ana.pinuela@atos.net</a>

### Business Impact

MaTHiSiS will support learning across a variety of learning contexts using a variety of devices with personalized and adaptable learning paths always taking into consideration the 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, fostering the interactivity between technology and learners/tutors/caregivers.



# SONATA

SONATA NFV: Agile Service Development and Orchestration in 5G Virtualized Networks

### 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.

Web	<a href="http://sonata-nfv.eu">sonata-nfv.eu</a>
Budget	8,256,066 €
Funding	6,657,721 €
Date	Jul 2015
Coordinator	Atos Spain
Contact	<a href="mailto:josep.martrat@atos.net">josep.martrat@atos.net</a>

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.



# BODEGA

## Proactive Enhancement of Human Performance in Border Control

### Challenges

BODEGA aims at investigating and modeling human factors in border control to provide innovative, ethically and societally compatible socio-technical solutions for enhancing border guards' performance.

It directly tackles with current challenges in border security, such as:

- The "presumed ability" of border guards to perform the border control tasks cannot be quantified. The limits of their abilities (psychological, technical, knowledge, training status) are unclear and differ considerably within the border guard community across Europe.
- Automated systems, such as automated border control (ABC) gates, document scanners, and face detection algorithms are spreading steadily within the border control process. How much does this influence the abilities of the border guards? Does it improve or decrease certain abilities? Are there learning effects? Are there other effects like familiarisation, which leads to a shifting of responsibility to the machine?
- Operational challenges are often not addressed in holistically include human factors. An additional factor is that operational environment, traveler flows, and profiles and working methods vary between different border control points and countries in EU. Growing border crossing volumes put heavy pressure on border crossings points, which manifest themselves as queuing and crowds. In this current situation, the necessary rate of organizational changes brings challenges. It is crucial that attention is paid to making the working procedures more and more effective.
- Automated border controls are also quite new for travelers and not all the potential users are aware of the concept of automated border control and the possibility to conduct border control processes independently with self-service. Travelers' behavior and problems with using the system reflect directly on border guards' work and their efficiency.

### Value Proposition

BODEGA applies a holistic approach to human factors to further scientific understanding of psychological aspects, affecting border guards' task performance. The project researches, develops and demonstrates human factors at all different border types: land (both road and rail), sea and rail.

BODEGA investigates the psychological abilities, needed for border guards' optimal performance by

1. conducting literature review about psychological abilities such as attention/concentration, face recognition, detection of lies, as well as analysis of psychological factors which might affect task performance of border control stakeholders, and
2. summarizing and comparing different studies already performed by border guard authorities and
3. performing additional studies testing the abilities of border guards to performing several critical border control tasks.

### Outcomes

- Scientific results on the shortcomings/limits of the current border control process due to human factors.
- Recommendations for the split of work between humans and machines and overall performance in border checks.
- Contributions for the effective implementation of the Smart Borders initiative.
- Insights on how to improve the travelers' experience towards a more efficient and easy understanding of the automated border control experience

BODEGA develops the PROPER toolbox (Proactive Enhancement of Human Performance in Border Control) which integrates the BODEGA results and solutions, providing information, measures, software and other practical tools to empower border stakeholders to take justified actions. The PROPER toolbox targets border control guards and authorities as well as decision-makers and industry.

Web	<a href="http://bodega-project.eu">bodega-project.eu</a>
Budget	4,999,238 €
Funding	4,999,238 €
Date	Jan 2015
Coordinator	Teknologian tutkimuskeskus VTT Oy
Contact	<a href="mailto:raul.sevilla@atos.net">raul.sevilla@atos.net</a>

### Business Impact

The overall regular passenger flow continues to grow at European external borders. In total it has been forecasted that in 2020 there will be over 700 million border crossings over the Schengen external borders. Frontex emphasizes that the growth of regular traffic in recent years has required increased resources from the border authorities to maintain security and facilitate travel. Because of the situation, new approaches and innovative solutions to increase the efficiency of the currently available resources are necessary.

BODEGA enables a leap to border control towards improved effectiveness and harmonisation across Europe. It supports the security of EU borders by introducing means to support new technology implementation and the preparedness and willingness to possible changes in border control procedures introduced by the Smart Borders package, and subsequent initiatives.

BODEGA and the toolbox to be developed take account of the complexity of the duties performed by officials at the border and establish tools to make progress in their professional lives. BODEGA shows how important it is for border guards and the border management and border authorities to take interest in the human factors, ethics and user experiences of the travelers.



# TOXI-triage

## Tools for detection, traceability, triage and individual monitoring of victims

### Challenges

TOXI-triage aims at five specific objectives :

- Accelerated delivery of situational awareness, allowing to quickly assess the location of the crisis and the nature of the crisis agent
- Command and Control with secure, dynamic and seamless communications, allowing the commanders of the crisis to quickly have access to all the information related with the crisis and the ability to quickly issue commands to the proper teams in the field
- Traceable point-of-care diagnostic tests with integrated casualty tracking, allowing first responders to have a complete clinical history of each casualty during the crisis
- Comprehensive field toolbox of CBRN threats for end-users, providing first responders an invaluable help system to carry on their operations during the crisis,
- Protocol for the registration of biomarkers of injury from CBRN poisoning with the European Medicines Agency, letting researchers register their findings in the European Medicines Agency
- Establish a community of commerce and deliver a commercial vision, resulting in the valid commercial exploitation of the results of the project

### Value Proposition

- Provision of a full crisis management system able to easily integrate new sensors as new sensing technologies are created, leading to optimal situation awareness
- Full command & Control, providing crisis commanders with all the information of the crisis that they need and the ability to directly send orders to all relevant teams on the field
- Full integration with a tag & trace system allows for complete tracking of casualties, equipment and samples
- Social media connector allows for media tracking of people during and even before the crisis is detected
- Field toolbox for helping first responders on the field

### Outcomes

- The component responsible for gathering data from all sensors, the TOXI-triage Data Hub, is a reusable platform able to gather data from sensors and represent them geographically, which is already being reused in other projects
- Decreased response time for crisis teams, especially for detecting the crisis and broadcasting the agent of the crisis to all teams involved in the crisis
- Full crisis clinical history of each patient available both at control room and hospitals
- Ability to detect crisis before the sensors detect the agent thanks to social media connector and people's tweets
- Threat database containing

Web	<a href="http://toxi-triage.eu/">http://toxi-triage.eu/</a>
Budget	12,906,00 €
Funding	11,966,000 €
Date	Jan 2015
Coordinator	University of Loughborough
Contact	<a href="mailto:dario.ruiz@atos.net">dario.ruiz@atos.net</a>

### Business Impact

- Dual use technology reusable for any kind of incident management
- Improvement of crisis management thanks to the ability of easily adding new sensor types and the decreased response time
- Improved information provided to hospitals through the use of the tag & trace system





Innovation  
Hub

# Innovation Hub

Fostering the innovation, technology transfer and new business from research results



## About us

The Innovation Hub (IH) unit was born to foster and facilitate the innovation at the Research and Innovation department (ARI). In order to achieve such mission, about twenty business consultants and communication experts work in collaboration with researchers, technicians and managers in innovation projects to support them in finding the best way to communicate and bring their technological results closer to the market; to envisage the impact of future research may have on the market; and to facilitate the transfer of generated innovative results to the Atos business units



Clara Pezuela

## Objectives

The main objectives of the IH are:

- Maximize the impact of the ongoing research projects in and out of Atos. Thanks to the large and extensive experience of Atos in this kind of projects, we apply an own and proven methodology based on latest marketing and business development techniques, and a catalogue of good practices and examples for plans and reports, which have entailed satisfactory results in numerous projects.
- Transfer the solutions we consider relevant to generate new business in Atos, bringing the research results closer to the market and demonstrating the innovative capacity of Atos. This requires establishing a permanent link with the business units and communicate internally in an efficient and constant manner our results.

To ensure a proper transfer, we provide incubation units for the most promising solutions aligned with the company's strategy. The idea is to transform the ARI results into solutions reusable in commercial projects. Each incubator is in charge of mature and evolve the seed solution, by fostering the development of pilots with customers or internal proof of concepts, to show the business feasibility of the solution. Besides, each incubator (called shuttle) supports the elaboration of commercial bids and tenders which include the use of such solutions; provides training to the business units; and offers technical support to deliver projects born from the transferred solution.

# Shuttles

## FIWARE

FIWARE is an open standard framework for developing smart applications supported by the FIWARE Foundation. Atos has a complete and end-to-end offering on FIWARE and several solutions based on it (CityGO and Atos Urban Data Platform). The shuttle is incubating the Atos Urban Data Platform, an open and standard solution for smart cities based on FIWARE technology. It allows integrating and collecting information from sensors and other data sources, normalizing that data and processing it to provide aggregated and intelligent views of data to support the decision making. As part of this shuttle we are also commercializing CityGo, the intelligent mobility application for transportation in cities. An expert team in FIWARE technologies and smart cities context is working with customers and Atos business units to leverage a long term investment in research.



## AGORA

AGORA is an Open B2B data-sharing platform for the automotive market. It handles access and trade-off of data from different mass data sources (Connected Vehicles, Home Systems, etc.) allowing Services Providers to create new B2B and B2C data-based products and services taking the opportunity to connect to thousands of data consumers which aims to access to digital infotainment tailored services to address specific customer's needs.





# Commercial Offers

## SOLUTION



**Capturean**  
social intelligence

## Capturean 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.

### 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.







# FIWARE

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. Visit our [factsheet](#).

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

\*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 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 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. 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.



# Innovation Management

Do you need to catch up with innovation?

We are here to help you!

Based on our 30-years experience, we have developed efficient working processes, methodologies, knowledge and [collaborative tools](#) that can be used for the benefit of our 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.

We offer support services that cover the whole cycle, including 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 workshops, 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.

Document: [ARI 3C's \(Challenges - Creativity - Co-Work\)](#)







# ARI 3C's

## Challenges, Creativity and Co-work

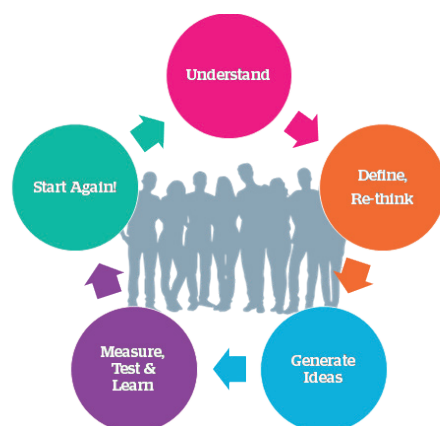
Do you know why organizations are increasingly interested in workplace dynamics, collaboration, communication, employee experience & organizational culture?

We believe that successful and sustainable companies are those with the capacity to adapt to changes, are willing to accept that there are new open ways of doing things and want to mobilize absolutely all their internal and external resources to generate more value.

Atos 3C's (Challenges, Creativity and Co-work) offering focuses on the human side of digital transformation, since resistance to change and organizational culture are the main barriers to transformation. Moving to an innovation mindset and a culture of empowerment represents a significant challenge for organizations.

Our aim is to provide your organization with the best tools and mechanisms to foster innovation, facilitate fresh thinking and idea generation towards innovative solutions. It consists of different phases that help developing and analyzing the challenge to find and co-create new solutions.

As you can see, **people are at the center of our approach**. It is not about technology, but about the change of mindset in the whole organization enabling the adoption of technologies. And it is also about new ways of collaborating, as teams are now more oriented to efficiency and success.



### Why don't you start with?

**Challenges4Us:** a 4-5 hours session that can be run in one morning. We organize compact workshops oriented to solving complex situations in projects, operations or sales activities. Problem-solving techniques are applied fast and lead to a co-prioritized roadmap for future steps.

**Design Thinking:** a full day workshop during which participants learn to analyze, empathize, observe, provide solutions, prototype, iterate, test and implement ideas, keeping in mind that collaboration is at the heart of innovative solutions.

**Disrupt-IT:** a 2-days workshop 'out of the office'. This hands-on activity is designed to foster the generation of innovative ideas addressing acknowledged challenges. We propose individual and group dynamics that foster creativity and ideas generation, inciting participants to adopt an innovation mindset that remains as a value for the organization.

**There's much more, so don't hesitate to contact us at [es-atosresearch@atos.net](mailto:es-atosresearch@atos.net)**

### What is it about?

We help people identifying barriers and opportunities based on real needs and encourage teams to solve problems with a new mindset. We have designed different hands-on sessions where participants learn by doing and, with the support of our largely experienced team, put into practice innovation and creativity techniques.

### Types of Innovation Workshops



Challenges4us	Design Thinking	Co-creation	Value proposition
Talent management	Disruptive IT: for disruptive innovation	Hackathons	BTIC Innovation workshops with clients
Innovation & creativity	Bootcamps	...and much more!	😊



# CityGO

## Transportation Planner and Intelligent Mobility Solution

### 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.

### 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**.

### 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.

For more information contact: [Clara Pezuola at Atos](mailto:Clara.Pezuola@atos.net)







# Data MarketPlace

Open and making accessible the mobility data generated by end-users

## Description

Transport and Mobility is one of the key industry in Europe which is rapidly increasing the connectivity and access to on-board digital services when using the different transport modes. The growing adoption in Cities of Mobility as a Service (MaaS) is boosting the conceptualization of making the user the central point of transport systems where they can purchase personalised mobility experiences based on their demands and behaviors. In fact, it is only possible by open and making accessible the mobility data generated by end-users when users different transport modes (vehicles, motorbikes, e-sharing services, etc.). A large amount of continuously gathered data by road vehicles among others represents major big data-driven business potentials, not only for the automotive industry but also for cross-sectorial industries with interdisciplinary applications. Today, this major business potential is still locked since the smartphone and mobile internet industry domain - that leverages such potentials.

Indeed, the data generated will have more value itself than the price paid by consumers to purchase mobility services, for instance, it will disrupt the industry for OEMs since Car Sales will be no longer the main source of revenue from them. The tendency is moving towards the expansion of the company value proposition as data as core assets of the operations and inherent increase the loyalty and customer satisfaction when using tailored and personalized services from multiple cross-sectorial services providers.

Atos understand the potential surrounded the monetization of data as company assets, and therefore it has been developed the Data Marketplace, an Open B2B data-sharing platform, that handles the access and trade-off of data from different mass data sources (Connected Vehicles, Home Systems, etc.) allowing Services Providers to create new B2B and B2C data-based products and services taking the opportunity to connect to thousands of data consumers which aims to access digital infotainment tailored services to address specific customer's needs. It opens a new world of applications and services, improving car safety, reliability and convenience.

## Business Challenge

As a clear example of the potential of Inside today's vehicles, ~4000 CAN-Bus signals/sec are processed in comparison to very few signals in smartphones and similar devices. This large amount of continuously gathered vehicle data represents major big data business potentials, not only for the automotive industry but for cross-sectorial industries with interdisciplinary applications. With today's proprietary approaches focusing on bringing services into vehicles and the applied ignorance of customer privacy concerns, this major business potential was still locked because the automotive industry was not yet able to establish an open service ecosystem equivalent to the ones in the smartphone industry.

Today, the major business potential of using Big Data generated by vehicles is still locked as the automotive industry hasn't been able yet to establish an open service ecosystem that leverages such potentials, following three major difficulties:

- Current offerings in the mobility and transport domain are driven by brand-specific business approaches. Those individual companies provide customer-centric services and try to establish new businesses with their proprietary

solutions, entering into entirely new markets that do not necessarily correlate with their actual core business. The result is brand-specific service solutions hindering long-term value creation by service providers due to fragmented environments and the lack of brand-independent vehicle data. This level of fragmentation results in economic inefficiency.

- Digital mobility services provided today primarily focus on the individual vehicle customer, which inevitably results in privacy concerns. There is a lack of consideration of how anonymized vehicle data may be used in other cross-sectorial contexts, which are explicitly not addressing the individual vehicle customer but provide other socially beneficial and economically relevant services.

The associated risk of collaboration on vehicle data between competitive OEMs can certainly be considered as one of the major obstacles, why such ecosystems have not yet evolved. However, to retain and advance the leading position of the European automotive industry, it is essential to leverage already emerging cross-border Big Data service solutions on a broader, brand-independent scale.

## Solution

Open Interfaces enable barrier-free access to the Marketplace

- Data catalogue and statistics for Service Providers
- Discovery of requested data and identification of the according to data owners
- Management of access permissions
- Delivery of data from the cloud to the Service Providers
- Accounting of transactions
- Open Software Development Kit (SDK)
- Data services
  - Pull data mechanism (API): GET Data/ Metadata...
  - Push data mechanism (AEON): Near-real time notifications of new data

## Benefits

Ecosystem

- External access to vehicle data enables viral growth of services provided bases on such data
  - Attractive and innovative services are created in a similar fashion to the mobile device app world
  - Linking vehicle data with data from other sectors enabling higher quality content
- Data Usage Rights

- The business with data usage rights enables return flows from service providers and content providers

User Acceptance

- The vehicle owner has incentives to provides his vehicle's data
- The owner/driver can fully control which data he provides to which Service Provider



# MASAI

Allowing to collect data from a variety of IoT devices in the manufacturing domain

## Description

MASAI is an efficient data integration software for manufacturing systems allowing to collect data from a variety of IoT devices in the manufacturing domain (Industry 4.0), that is not entirely covered by existing proprietary solutions. In a typical IT infrastructure, it is usually located at the gateway level, between data producers and consumers. One of its main features is that it can be deployed in low-level devices, like Raspberry Pi. Other general characteristics of the component are:

- Interoperability, by supporting well-known and most common protocols for IoT related data sources.
- Scalability, due to the amount of data generated by IoT devices, the module's performance behavior should remain stable during its use, being able to react to different data loads situations.
- Easy-to-use and install, simplifying the interoperability among different systems.
- Take advantage of the use of FIWARE based technologies.

## Business Challenge

Today's enterprises are linearly organized and optimized within the boundaries of companies and system silos, while companies of the future will fulfill individual customer needs by using a collaborative and agile network of capabilities. In this context, IoT will have an important role in the vertical and horizontal integration of systems. New IT technologies allow to retrieve, connect and interpret all the data generated during the manufacturing process. Making use of that data will help companies to have more control over their own processes, supporting them when decision making is needed and so, becoming more effective and competitive. In this manner, it is a key action to retrieve it, understand it, and use it. MASAI allows gathering data from the different machinery available at companies' shop floor level to convert it into an added-value asset by putting it available to be analysed by other complex data analytics systems. It is continuously evolving, to be aligned and close to the manufacturing industry needs. In this manner, some key features have been included like the support of the OPC UA communication protocol, the integration with Siemens MindSphere and Visualisation tools like Graphana, that provides MASAI with some features to differentiate from its competitors.

Additionally, aiming at enriching MASAI capabilities, it is intended in the near future to be introduced in other areas of application, for example, the agricultural domain. The European automotive industry, it is essential to leverage already emerging cross-border Big Data service solutions on a broader, brand-independent scale.

Among its main capabilities, it can be highlighted:

- Based on Generic Enablers from FIWARE and extended to enhance communication capabilities.
- Facilitates interoperability among systems.
- Devices Virtualization, which allows to aggregate data and the creation of virtual entities.
- Data filtering, limiting dataflow or access to inaccurate data to higher layers.
- Provides monitoring of devices capacities.
- Supports well-known IoT protocols: MQTT, OPC UA, AMQP, and socket.io.
- Allows communication with Cloud platforms like FIWARE and Siemens MindSphere.
- Visualisation capabilities of real-time and historical data to facilitate the follow up of a process.

## Benefits

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## Solution

MASAI is a Data Collector and System Integrator middleware component focused on IoT devices developed based on the experience gained in Manufacturing. MASAI is composed by a set of components that tackle three different issues: communication, management of the devices and handling of data:

- Communication: grating interoperability and adaptation between different protocols and the matching between consumers and providers of data.
- Device Management functionalities to enclose generic information about devices and also to address their security and connectivity.
- Data handling functionalities, MASAI is also granted with a subcomponent that ensures that the data obtained in the IoT world is pre-filtered before being passed to a consumer, reducing the flow or the quantity of inaccurate data.





# Pocket mHealth

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 Heal 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).

## 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.

## 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



# Atos Urban Data Platform

Open, interoperable and  
standard solution of Atos for  
Smart Cities.

## Description

**Atos Urban Data Platform (AUDP)** is the open, interoperable and standard solution of Atos for Smart Cities. It allows integrating and collecting information from sensors and other data sources, normalising that data and processing it to provide aggregated and intelligent views of raw data to support the decision making.

AUDP is powered by **FIWARE** technology, which is an open source components framework to access and manage heterogeneous context information through APIs. It relies on NGSI standard (Next Generation Service Interface) for the exchange of context information. It provides a set of Functional blocks called Generic Enablers to build smart solutions from context information. Atos is Member of FIWARE Foundation since 2016. The FF has currently more than 190 members across the world, and its mission is to maintain, evolve, globalise and support the industrialisation of FIWARE.

The main functionalities of AUDP are:

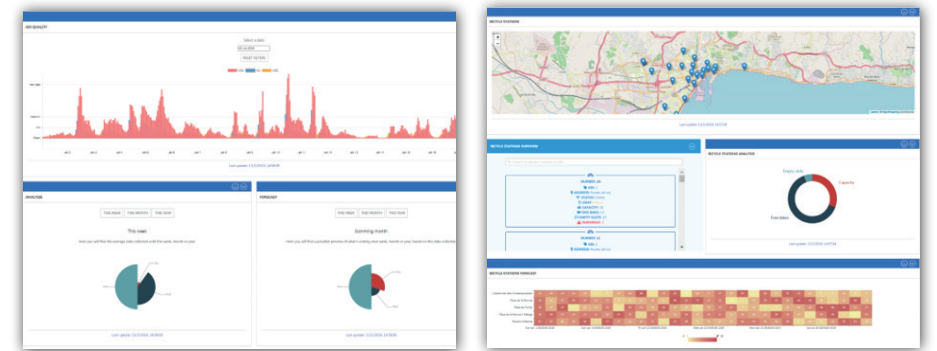
- Collect information from the environment, through sensors or open data sources, mobile devices u other sources fulfilling the security and privacy requirements.
- Full management of all IoT devices integrated in the platform
- Normalise the collected data to the NGSI format, translating from source formats and different protocols to the platform data models
- Distribute the normalised data to the diverse vertical services connected to the platform (air quality, traffic management, lighting, etc)
- Real time data analysis, to support the decision making
- Visualisation of data in a graphical and visual way through maps, graphics, alarms, etc
- Data provisioning for developing on services from them
- Triggering of actions or actuations according to some defined rules and analysed data
- Secured access control to devices, data and services

## Business Challenge

AUDP is addressing one of the main demanding type of solutions by cities and customers: the aggregation of data from diverse information sources (sensors, social networks, open data portals, historical data, management systems and many more) to developed context-aware applications and provide smart services to citizens, municipalities and business companies. AUDP is following a commonly adopted approach by many cities and IT provides in the world by relying in NGSI standard, which is currently providing the unique standard API to access context information. The integration of diverse technologies to provide business intelligence, efficient management of IoT devices, context management of data, advance visualisation of analysed data and overall security approach is positioning Atos as a good IT provider for your smart city challenge. Atos is also providing the cities and customer the analysis of the use cases and business scenarios which may provide a better response to their needs and provide an added value and better service to the citizens and users.

## Solution

AUDP has been developed using the most novel technologies both in backend and frontend. The backend relies on mostly on Python technology and Django framework, using MongoDB and Postgress databases and data analytics and machine learning techniques (Pandas, Keras, Tensorflow). The frontend is a responsive multidevice portal based on Node.js framework and using Vue.js, HTML5 and JavaScript. The communication among components is based on JSON and REST APIs. The solution is deployed by using NGINX, a free, open-source, high-performance HTTP server, reverse proxy, and IMAP/POP3 proxy server; and Unicorn, a Python WSGI HTTP Server for UNIX.



## Benefits

The solution is of easy integration with any external system via API (ERPs, issue management systems, etc); deployable both in cloud and on premise, according to customer's needs; and replicable and customizable to each customer's requirements. AUDP is relying on consolidated open source technologies in the market which facilitates the adoption and lower the maintenance costs and prevent the vendor lock-in as the AUDP is delivered under open source as well. The support to the open source components from FIWARE is guaranteed by the FIWARE Foundation and Atos is providing full support to the AUDP platform, keeping the evolution of the technology up to date. Thanks to the modularity of the platform architecture, a future extension to adapt it to new scenarios or to add new functionalities would be quite straightforward. The platform is scalable according to the volume of sensors, data and services to provide the required level of service.

Doc.: [Description and references use cases](#)



A close-up, horizontal view of a stack of several books. The books are bound in white covers, and their pages are visible, showing a light cream or off-white color. The books are stacked neatly, with the edges of the pages creating a rhythmic pattern. The word "Publications" is overlaid in a bold, black, serif font on the right side of the stack.

**Publications**



Publications

Publication	ARI Author/s	Details	Year	Link
EU project 5GTANGO adds 5G service verification functionalities	ARI Marcomm	Project press release published on Atos Website	2018	<a href="#">»»»»</a>
The JOSPEL European Project improves the energy efficiency of electric vehicles	ARI Marcomm	Project press release published on Atos Website	2018	<a href="#">»»»»</a>
Atos works on European project in collaboration with South Korea on Artificial Intelligence, Blockchain and IoT	ARI Marcomm	Project press release published on Atos Global Website	2018	<a href="#">»»»»</a>
Atos promotes a European project in collaboration with Korea on Artificial Intelligence, Blockchain and Internet of Things	ARI Marcomm	Project press release published on Atos Website	2018	<a href="#">»»»»</a>
Atos leads the DEFEND project that facilitates compliance with the new General Data Protection Regulation	ARI Marcomm	Project press release published on Atos Website	2018	<a href="#">»»»»</a>
Atos leads a European project that will allow sharing data safely through unsecured networks	ARI Marcomm	Project press release published on Atos Website	2018	<a href="#">»»»»</a>
Artificial Intelligence as the second phase for IoT - Part 2	Jose Gato	Part 2 of Bylined Article about AI and IoT, published at Atos Blog	2018	<a href="#">»»»»</a>
Artificial Intelligence as the second phase for IoT - Part 1	Jose Gato	Part 1 of Bylined Article about AI and IoT, published at Atos Blog	2018	<a href="#">»»»»</a>
The European project LEPS promotes cross-border electronic identification (EID) in European industry	ARI Marcomm	Project press release published on Atos Website	2018	<a href="#">»»»»</a>
Atos participates in MaTHiSiS an EU educational project in which teachers and students interact with robots	ARI Marcomm	Project press release published on Atos Website	2018	<a href="#">»»»»</a>
From Innovative Niches to a Cooperative IoT Ecosystem. Creating Business Value for Federated and Interoperable IoT Platforms.	Lara López et al.	2nd Global IoT Summit: IoT Technologies and Applications for the Benefit of Society	2018	
Towards Digital and Personalized Healthcare and Well-being Solutions for the Workplace	Juan Mario Rodríguez, Santiago Aso, Carlos Caveró, Ana M Quintero, Ivo Ramos, Manuel Perez, Cesar Mediavilla, Blanca Jordán	Application of Pocket mHealth as a tool for occupational health, presented in the Workshop on Personalized Health & Intelligent Workplaces Transforming Ergonomics '18	2018	<a href="#">»»»»</a>
A Situational Approach for the Definition and Tailoring of a Data-Driven Software Evolution Method	Jesús Gorroñogoitia	Successful software evolution heavily depends on the selection of the right features to be included in the next release. Such selection is difficult, and companies often report bad experiences about user acceptance. To overcome this challenge, there is...	2018	
The MegaM@ Rt2 ECSEL project: MegaModelling at Runtime-Scalable model-based framework for continuous development and runtime validation of complex systems	Jesús Gorroñogoitia	This paper presents an overview of the ECSEL 1 project entitled "MegaModelling at runtime - Scalable model-based framework for continuous development and runtime validation of complex systems" (MegaM@Rt2), whose aim is to address the challenges facing...	2018	<a href="#">»»»»</a>

Publications

Publication	ARI Author/s	Details	Year	Link
ZONESEC: built-in cyber-security for wide area surveillance system	Aljosa Pasic, Jose Ramón Martíne...	It describes how the multi-agent architecture originally proposed in ZONESEC project can be applied also to cyber-security components in order to address challenges such as cost, complexity or difficulty to coordinate activities in distributed settings,...	2018	<a href="#">»»»»</a>
FENTEC Project Interview published in 'El País'	Francisco Gala	Interview in El País newspaper	2018	<a href="#">»»»»</a>
ARIES: Radio Interview	Pedro Soria, Alicia García	Gestiona Radio	2018	<a href="#">»»»»</a>
Artificial Intelligence as the second phase for IoT	Jose Gato Luis, Daniel Calvo, David Gomez, Adrian Arroyo	ATOS Blog: <a href="https://atos.net/en/blog/artificial-intelligence-second-phase-iot-part-1">https://atos.net/en/blog/artificial-intelligence-second-phase-iot-part-1</a>	2018	
Smart Cities under Attack. Chapter of Human-Computer Interaction and Cybersecurity Handbook	Daniel Calvo	<a href="https://www.crcpress.com/Human-Computer-Interaction-and-Cybersecurity-Handbook/Moallem/p/book/9781138739161">https://www.crcpress.com/Human-Computer-Interaction-and-Cybersecurity-Handbook/Moallem/p/book/9781138739161</a>	2018	
Knowledge is power	Guadalupe Rodriguez Diaz	Thinking Cities (Vol 5	2018	
Real-time Probabilistic Data Fusion for Large-scale IoT Applications	Juan Sancho	IEEE Access, vol. PP, no. 99, pp. 1-1. doi: 10.1109/ACCESS.2018.2804623	2018	
Supporting a Cloud Platform with Streams of Factory Shop Floor Data in the Context of the Intustry 4.0	Javier Hitado	It was published at 2018 IEEE 16th International Conference on Industrial Informatics (INDIN)	2018	<a href="#">»»»»</a>
EO4wildlife: A Cloud Platform to Exploit Satellite Data for Animal Protection	Daniel Rodera	EO4wildlife was presented during the Digital Poster session at the ESA Earth Observation ?-week hosted in ESA-ESRIN (Frascati) from 12 to 16 November 2018.	2018	<a href="#">»»»»</a>
Parallelization and Deployment of Big Data Algorithms: The TOREADOR Approach	Iván Martínez, Jorge Montero, To...	32nd International Conference on Advanced Information Networking and Applications Workshops (WAINA). DOI: 10.1109/WAINA.2018.00120	2018	<a href="#">»»»»</a>
Knowledge is power	María Guadalupe Rodríguez Garzia	Article in the newspaper Thinking Cities (Vol V, Mayo 2018): behind the scenes guided tour of Ikaas project	2018	<a href="#">»»»»</a>
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	2018	<a href="#">»»»»</a>
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)	2018	
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.	2018	<a href="#">»»»»</a>





# Events

# Events

Event	Presentation Title	Presentation Speaker	Venue	Link	Date
ICT 2018	DataBench Presentation at the session: Impact of the Data-Driven AI in business sectors	Nuria de Lama	Vienna, Austria		Dec
FIWARE Summit 2018	Connecting to LoRa networks: practical demo	Daniel Calvo			Dec
FIWARE Summit 2018	Parking Estimation AI Service for FIWARE-Powered Smart City Platforms	Daniel Calvo			Dec
FIWARE Summit 2018	Connecting sensors to FIWARE with IDAS	Daniel Calvo			Dec
ARI Digital Show 2018	Elastest: "Testing software apps have never been this easy"	Malena Donato	Madrid, Spain	<a href="#">»»»»</a>	Dec
ICT Proposers Day 2018	Parking Estimation AI Service for FIWARE-Powered Smart City Platforms	David Gomez			Dec
ARI Digital Show 2018	CEDUS: "The city as a platform for a positive mobility impact"	Esther Garrido	Madrid, Spain	<a href="#">»»»»</a>	Dec
ARI Digital Show 2018	ABC4EU: "Mobile control in European borders"	Ross Little	Madrid, Spain	<a href="#">»»»»</a>	Dec
ARI Digital Show 2018	ARIES: "May your e-ID be with you"	Javier Presa	Madrid, Spain	<a href="#">»»»»</a>	Dec
ICT 2018: EU-US Roundtable on the Interplay of Technology & Policy in Data Privacy	GDPR and data usage control	Aljosa Pasic	Vienna, Austria	<a href="#">»»»»</a>	Dec
ARI Digital Show 2018	LEPS: "Secure and trustworthy cross-bordering services with electronic identification"	Juan Carlos Perez	Madrid, Spain	<a href="#">»»»»</a>	Dec
Security Research Event	Live demonstration of TOXI-triage integrator	Dario Ruiz	Brussels		Dec
ARI Digital Show 2018	AutoMat: "MarketPlace for the creation of innovative services through Vehicle Big Data, and Cross-CPP as the evolution of the MarketPlace with multiple data sources such as Smart Buildings and Automotive Housing"	German Herrero	Madrid, Spain	<a href="#">»»»»</a>	Dec
ARI Digital Show 2018	EO4wildlife: "Copernicus at the service of the protection and conservation of the marine wildlife"	Jose Lorenzo, Juan Alonso	Madrid, Spain	<a href="#">»»»»</a>	Dec
ARI Digital Show 2018	VICINITY: "A walk through the different opportunities for collaboration and co-creation with H2020, and VICINITY as a concrete example of those opportunities"	Carmen Perea	Madrid, Spain	<a href="#">»»»»</a>	Dec
ICT 2018	Presentation of the results of the HeartMan Project	Carlos Caverio	Vienna, Austria		Dec
EBDVF 2018	DataBench presentation at the session: "Benchmarking Big Data"	Tomas Pariente	Vienna, Austria		Nov
"European Big Data Value Forum: Data Privacy Workshop""From Data Protection to Fairness and Trust: the way forward""	PAPAYA Project	Alberto Crespo	Vienna, Austria	<a href="#">»»»»</a> <a href="#">»»»»</a>	Nov
EBDVF 2018	Big Policy Canvas: Defining the Future of Decision and Policy Making through Big Data	Nuria Rodríguez Domínguez, Esther Garrido Gamazo	Vienna, Austria	<a href="#">»»»»</a>	Nov
ERNCIP meeting	ZONeSEC at the end of the road	Jose Ramón Martínez	London, UK		Nov
EO4wildlife Final Event	To mark the project's successful completion, and share these results, EO4wildlife organised its Final Event.	Jose Lorenzo	Toulouse (France) at the Cité...	<a href="#">»»»»</a>	Nov
20th ISSE Conference: Securing Future European Business through Digital Transformation	Trust Translation - Trustworthy Communication Services Pilot	Alberto Crespo	Brussels, Belgium	<a href="#">»»»»</a>	Nov



Event	Presentation Title	Presentation Speaker	Venue	Link	Date
FIWARE Global Summit 2018	Smart Industry Processes and Data Interoperability	Jorge Rodriguez	Málaga (Spain)	<a href="#">»»»</a>	Nov
3rd Joint Workshop CEF - ERASMUS+: Taking forward the EU Student eCard initiative	ESMO Project Status	Ross Little	Brussels, Belgium		Oct
Industry Monitoring Group LEPS project	Spanish postal digital services connection to eIDAS	Juan Carlos Pérez	Murcia, Spain	<a href="#">»»»</a>	Oct
EIT Digital	CEDUS: Digital Urban Services: giving value to city-generated data	Esther Garrido Gamazo	EIT, Pozuelo de Alarcón (Madrid)		Oct
CLARITY at SNF 2018 Simposio Nacional de Firmes	Proyecto CLARITY: Aplicación a las Infraestructuras de Carreteras en España	Miguel Angel Esbri	E.T.S.I.C.C. Madrid (Spain)	<a href="#">»»»</a>	Oct
eu-LISA Industry Round Table	Smart Border Mobile System Presentation	Ross Little	Tallinn, Estonia	<a href="#">»»»</a> , <a href="#">»»»</a>	Oct
Atos Expert Convention	eIDAS-Compliant Cross-Border Authentication	Alberto Crespo	Madrid, Spain	<a href="#">»»»</a> , <a href="#">»»»</a> , <a href="#">»»»</a>	Sep
EGOV-CeDEM-ePart 2018 conference	Big Policy Canvas: Transforming Decision and Policy Making through Big Data	Nuria Rodríguez Domínguez, Esther Garrido Gamazo	Donau University, Krems (...)		Sep
CRITIS2018	"ZONeSEC architecture and integration; challenges and lessons learnt"	Jose Ramón Marínez	Kaunas, Lithuania		Sep
ENRCIP early warning group	ZONeSEC early warning technologies	Jose Ramón Martínez	Madrid, Spain		Sep
8th Samos 2018 Summit on ICT-enabled Governance	WATIFY: Awareness raising campaign for the modernization of Europe's industry	Aljosa Pasic	Samos, Greece		Jul
8th Samos Summit on ICT-enabled Governance	ARIES: "Is there life after death: the new role for government issued electronic identity cards?"	Aljosa Pasic	Samos, Greece	<a href="#">»»»</a>	Jul
ESOF 2018	WATIFY: "Awareness raising campaign for the modernization of Europe's industry at the workshop "Meaningful collaboration for RRI in industry: how to balance cooperation, competition and citizen involvement""	Lydia Montandon	Toulouse, France		Jul
WATIFY Webinar	Next Generation Cloud	Ana Juan Ferrer	Online		Jun
OpenExpo Europe	WATIFY: Awareness raising campaign for the modernization of Europe's industry	Ana María Morales	Madrid, Spain		Jun
OpenExpo Europe	Elastest	Malena Donato	Madrid, Spain		Jun
IoT Week	WATIFY: Awareness raising campaign for the modernization of Europe's industry	Nuria de Lama	Bilbao, Spain		Jun
EEMA Annual Conference 2018 Maximising Digital Transformation Using Trusted Identities	ARIES: How to increase use of government issued e-ID cards by private sector	Aljosa Pasic	London, United Kingdom	<a href="#">»»»</a>	Jun
WATIFY Webinar	Internet of Everything lab: ready to be hyper-connected	Jose Gato	Online		Jun
SDW Conference	Big data analytics as a support tool for risk analysis	Raúl Sevilla	London, UK		Jun

Event	Presentation Title	Presentation Speaker	Venue	Link	Date
BLED eConference	WATIFY: Awareness raising campaign for the modernization of Europe's industry	Lydia Montandon	Bled, Slovenia		Jun
Fly-Sec Cluster Meeting of Border Security Projects	BODEGA - Border Security Projects Presentations	Raúl Sevilla	Brussels, Belgium		Jun
ICE / IEEE Conference 2018	WATIFY: Awareness raising campaign for the modernization of Europe's industry	Aljosa Pasic	Stuttgart, Germany		Jun
Workshop on Personalized Health & Intelligent Workplaces Transforming Ergonomics pHIWtE'18	Presentation of the Paper: Towards Digital and Personalized Healthcare and Well-being Solutions for the Workplace		Rome, Italy	<a href="#">»»»</a>	Jun
Smart AgriFood Summit	WATIFY: Awareness raising campaign for the modernization of Europe's industry	Nuria de Lama	Málaga, Spain		Jun
Workshop Connected Factories	WATIFY: Awareness raising campaign for the modernization of Europe's industry	Jorge Rodriguez	Bilbao, Spain		Jun
2nd Joint Workshop CEF - ERASMUS+: Taking forward the EU Student eCard initiative	ESMO: Attribute Set Proposal	Ross Little	Luxembourg, Luxembourg		Jun
FIWARE Summit	WATIFY: Awareness raising campaign for the modernization of Europe's industry	Jorge Rodriguez	Oporto, Portugal		May
WATIFY Webinar	How do you envision your future health with technology transforming the health sector?	Blanca Jordan	Online		May
WATIFY Webinar	Technologies to support software industry in providing better solutions	Clara Pezuela	Online		May
FIWARE Global Summit 2018	Connecting FIWARE to IoT	Daniel Calvo			May
FIWARE Summit 2018	Connecting LoRa with FIWARE	Daniel Calvo			May
BDVA Meetup Sofia	DataBench Toolbox	Tomás Pariente	Sofia, Bulgaria		May
R&D Innovation Excellence / Design Thinking Summit	WATIFY: Awareness raising campaign for the modernization of Europe's industry	Lydia Montandon	Amsterdam, Netherlands		Apr
IoT Forum Madrid	WATIFY: Awareness raising campaign for the modernization of Europe's industry	Lydia Montandon	Madrid, Spain		Apr
First Cyberwatching.eu Concertation Meeting	FENTEC Project (Lightning Talk)	Alberto Crespo	Brussels, Belgium	<a href="#">»»»</a> , <a href="#">»»»</a>	Mar
ABC4EU Final Conference: Harmonization of the Schengen Borders	Atos ABC4EU Final Pilot presentation	Ross Little	Brussels, Belgium	<a href="#">»»»</a>	Mar
Taller de Cambio Climático e Infraestructuras de Transporte: Impacto y Medidas de Adaptación	Proyecto CLARITY: Integrated Climate Adaptation Service Tools for Improving Resilience Measure Efficiency	Miguel Angel Esbri	AEMET, Madrid (Spain)	<a href="#">»»»</a>	Mar
1st Joint Workshop CEF - ERASMUS+: Taking Forward the EU Student Card	ESMO (eIDAS Enabled Student Mobility)	Alberto Crespo	Luxembourg, Luxembourg		Mar



Events

Event	Presentation Title	Presentation Speaker	Venue	Link	Date
WATIFY Webinar	Machine & Deep Learning	Jose Esteban Lauzan	Online		Mar
WATIFY Webinar	Privacy, Identity & Access Manager	Angel Palomares	Online		Feb
WATIFY Webinar	Drivers of the Digital Transformation: Data and Artificial Intelligence	Tomás Pariente	Online		Feb
Transfiere Málaga	WATIFY: Awareness raising campaign for the modernization of Europe´s industry	Clara Pezuela	Málaga, Spain		Feb
European Technology Transformation Week	WATIFY and Digital Manufacturing	Lydia Montandon	Parma, Italy		Feb
European Technology Transformation Week	Webinar: WATIFY and Innovation Management	Lydia Montandon	Online		Feb
European Technology Transformation Week	Webinar: WATIFY for Croatia	Aljosa Pasic	Online		Feb
Industry Monitoring Group LEPS project	LEPS Project scope, objectives and timetable	Juan Carlos Pérez	Online webinar		Jan

Prizes

1

**enerTIC Awards 2018**



ELVITEN Project finalist at the Smart Mobility category

The project ELVITEN, that demonstrates how electric light vehicles (EL-V) can be used in urban areas while integrated to the existing transport network at six European cities, won a recognition for being a FINALIST at the VI enerTIC Awards to the Innovation and Technology for Energy Efficiency at the Digital Era.

2

**13th International Conference on Availability, Reliability and Security (ARES 2018)**



**Best paper award**

Paper title: Flashlight: A Novel Monitoring Path Identification Schema for Securing Cloud Services

Paper abstract: Cloud monitoring is an essential mechanism for helping secure cloud services. Thus, a plethora of monitoring schemas have been proposed in recent years. Particularly, a newly proposed indirect monitoring mechanism outperforms others with the unique merit of addressing scenarios where the information of the monitoring target is not directly accessible. To conduct indirect cloud security monitoring, a key prerequisite is to obtain a special set of monitoring data termed "monitoring path". However, how to ascertain the monitoring path is still an open issue. The paper proposes a novel monitoring path identification mechanism to address the gap where the information of monitoring targets is inaccessible, analyzing data relations and data attributes.



# Platforms

## 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](http://www.networld2020.eu)

**NEM**

[nem-initiative.org](http://nem-initiative.org)

**NESSI**

[www.nessi-europe.com](http://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](http://www.ecs-org.eu)



**AIOTI**

[www.aioti.org](http://www.aioti.org)



**EFFRA**

[www.effra.eu](http://www.effra.eu)



**Future Internet**

[www.fi-ppp.eu](http://www.fi-ppp.eu)



**NIS Platform**

[resilience.enisa.europa.eu/nis-platform](http://resilience.enisa.europa.eu/nis-platform)



**BDVA**

[www.bigdatavalue.eu](http://www.bigdatavalue.eu)



**5G**

[www.5g-ppp.eu](http://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.



**EITHEALTH**

[www.eithealth.eu](http://www.eithealth.eu)



**EITDIGITAL**

[www.eitclabs.eu](http://www.eitclabs.eu)



# Platforms

## 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](http://www.ptferroviaria.es)



PLANETIC

[www.planetic.es](http://www.planetic.es)



PESI

[www.pesi-seguridadindustrial.org](http://www.pesi-seguridadindustrial.org)



NANOMED

[www.nanomedspain.net](http://www.nanomedspain.net)



LOGISTOP

[www.logistop.org](http://www.logistop.org)



ES.INTERNET

[esinternet.imasdtic.es](http://esinternet.imasdtic.es)



eVIA

[ametic.es/es/innovacion/plataformas-tecnologicas/evia](http://ametic.es/es/innovacion/plataformas-tecnologicas/evia)

## Standardization Organizations



OASIS

[www.oasis-open.org](http://www.oasis-open.org)



ETSI

[www.etsi.org](http://www.etsi.org)

## Special Interest Groups



FIWARE Foundation

[www.fiware.org/foundation](http://www.fiware.org/foundation)



ERTICO

[ertico.com](http://ertico.com)



EOS

[www.eos-eu.com](http://www.eos-eu.com)



CELTIC

[celticplus.eu](http://celticplus.eu)



Smart Cities Platform

[eu-smartcities.eu](http://eu-smartcities.eu)

Come with us  
to the future of  
technologies



# About Atos

Atos is a global leader in digital transformation with 120,000 employees in 73 countries and annual revenue of € 13 billion.

European number one in Cloud, Cybersecurity and High-Performance Computing, the Group provides end-to-end Orchestrated Hybrid Cloud, Big Data, Business Applications and Digital Workplace solutions through its Digital Transformation Factory, as well as transactional services through Worldline, the European leader in the payment industry. With its cutting-edge technologies and industry knowledge, Atos supports the digital transformation of its clients across all business sectors. The Group is the Worldwide Information Technology Partner for the Olympic & Paralympic Games and operates under the brands Atos, Atos Syntel, Unify and Worldline. Atos is listed on the CAC40 Paris stock index.

Find out more about us

**atos.net**

**atos.net/career**

Let's start a discussion together

