Digital and Hyperconnected World

ICT-EUROPEAN SOFTWARE INSTITUTE

Change brings opportunities. We love to imagine how digital services will be in a world even more interconnected and interactive, or how smart products will be used in our daily life, and what new software technologies will make this possible. We are committed to creating excellent business opportunities for our clients with creativity and determination.
TECNALIA Research & Innovation is the first privately funded applied research centre in Spain and one of the leading such centres in Europe. A combination of technology, tenacity, efficiency, courage and imagination.

We identify and develop business opportunities through applied research. Inspiring Business is a different, unique vision: we visualise ideas that generate value and provide creative technological solutions to produce real results.

At TECNALIA we are organised in 7 fully interconnected Business Divisions. Cooperation works thanks to the transversality of teams, projects and clients collaborating with each other, combining expertise and commitment. Our best asset is our team, made up of more than 1,500 experts who work to transform knowledge into GDP in order to improve people’s quality of life by generating business opportunities for companies.

We are committed to the future, society, our planet and our environment. This responsibility provides focus to our values and reinforces our activities.

"TECNALIA transforms Knowledge into GDP to improve people’s quality of life by generating business opportunities for Companies"
Digital and Hyperconnected World

We imagine what the digital future will be like. A world that is interactive and interconnected, more efficient, more intelligent, kinder, safer and with better services. We contribute to this digital world by creating technological solutions that will have an impact on our clients’ business. We imagine new services for the digital economy. We help to transform products and solutions into smart systems. We believe that innovation is the way to produce the best software systems more efficiently and safely. We are committed to creating excellent business opportunities for our clients.

Our Offer to Sectors that Design / Develop Software Systems

In a digital world with an increasing number of smart services and solutions based on ICT, it is essential to make good software products, with secured deadlines and costs. Equipment is required to produce high quality IT systems competitively, with a code that is efficient, reliable, sturdy, fault-tolerant, certifiable and made in due time, according to standards and at the lowest cost.

We design methods and technological tools for the entire life cycle of software systems development: productivity.

- CYBER-SECURITY
- QUALITY

Our Offer to Sectors that Handle Large Data Volumes

Many everyday objects are becoming more and more sophisticated, as they are being built with the ability to interact, process, predict, make decisions and act, based on a large amount of data to improve their functionalities. These are smart devices that lead to wider concepts: smart products and systems.

With technology, we help to create outstanding products and solutions, by incorporating the ability to analyze information, make decisions or learn: DESCRIPTIVE, PREDICTIVE AND PRESCRIPTIVE ANALYTICS.

Our Offer to the Digital Services Sectors

The way people communicate, are entertained, informed, buy and experience services in general is changing exponentially with the possibilities opened up by the new communication networks and devices. With richer contents in any device, with more natural, multisensorial ways to interact, with ubiquitous, mobile, personalized access in a more participative social context.

We help those who offer all kinds of services via digital platforms to gain a larger number of more enthusiastic consumers, by providing them with a unique experience:

- INTERACTIVITY
- ENTERTAINMENT
- MOBILITY

In order to provide our services, we draw on our expertise in the areas of knowledge and we use assets that we gain thanks to research and development creating excellent business opportunities for our clients.
Our Offer to Sectors that Design / Develop Software Systems

01. SOFTWARE SYSTEMS ENGINEERING

The IT industry is producing an ever increasing quantity of software. With shorter technological cycles, increasingly heterogeneous operational environments and more complex use and functioning requirements, the necessary skills to develop a good software product while still meeting deadlines and budgets are becoming more demanding than ever.

Our goal is to improve the result by working in the different sub-processes, from the selection of the IT architecture best adapted to the business objectives, to the specific needs of the development life-cycle.

We also provide support to the definition of strategies for the IT systems, as well as the migration and/or evolution of legacy systems, the engineering of system families (product lines), model-based development, systematic reuse and for the implementation of the most efficient practices.

TECNALIA's key offer /
- IT strategy for smart environments and complex systems; SOA strategies
- Technology, methods and tools for SW production and engineering, including agile methods
- Process and software development equipment improvement through multimodel approaches: CMMI-DEV, CMMI-ACQ, IT-Mark
- Change management based on quantitative methods: Lean, 6-Sigma, Agile high-maturity
- Requirement engineering, Model Driven Architecture (MDA)
- Systematic code reuse and Software Product Lines
- Methods and tools for the improvement of Software Factories
- Re-engineering for the modernisation of legacy systems
- Validation and Verification (analysis, tests, formal methods)

FAST
FAST enables the optimisation of the code of a software factory on the basis of re-utilisation, without generating dependency, thus allowing “resellability”, at all times. This multi-language tool adapts to the needs of each factory, allowing for the control and tracing of all the generated code.

GO4IT
Support tool for modernisation projects for COBOL systems. Its main characteristics are:
- It facilitates the identification and visualisation through file filters and calls from programmes
- It allows the monitoring of information flow
- Analysis of data files
- Identification of dead code

GO4IT not only allows the visualisation and analysis of the source code; it also allows the semi-automatic generation of Java code.

02. HW/SW ASSURANCE AND CYBERSECURITY

We are more and more dependent upon the smart and networked software applications of transport, energy, health or business-critical systems that involve our daily life. It is essential for these critical SW systems to achieve the maximum reliability and robustness against vulnerabilities and threats, either intentional or due to human errors or HW/SW failures. It is necessary not only that the processes and tools used to generate these systems meet quality standards; it is also necessary to ensure that the product generated is safer and robust.

At TECNALIA, we work on the innovation of advanced methods and tools for cost-effective, systems assurance and certification of critical applications and products. We work closely with international industries from the automotive, railway, aerospace and energy domains.

The terms “cyber-attack”, “cyber-war” and even “cyber-terrorism” have erupted recently in our day to day.

TECNALIA launches SEC4SCADA initiative: TECNALIA CyberSecurity Technology Competence Centre, making the SCADA (Supervisory Control and Data Acquisition) systems the cornerstone and center of attack and protection of the critical infrastructure.

TECNALIA's key offer /
- Support of reliability/safety requirements for certification and assurance
- Product/process comprehensive approaches, based on the “Assurance Case” concept, increasingly used in the industry
- Conformity assessment under industrial standards such as ISO 26262 (automotive), DO-178C/254, ARP 4754/4761 (airspace), IEC 61508 (automation), CEN 50126/50128/50129 (railways)
- Integration based on standard industrial system architectures (AUTOSAR, IMA) and multi-core platforms
- Model based methods and tools to provide support to quality assurance and safety, including evidence management, conformity management, traceability, impact analysis and metrics / estimations management
- Comprehensive security in Control Centers
- Industrial cybersecurity according to market standards
- Support PIC Law (Critical Infrastructure Protection Law)
- Cybersecurity in smartmeters, concentrators and EDs in low and medium voltage: Prime & DLMS / M&M

PROSSURANCE
Management system for the assurance and certification of critical systems, products and processes in the aerospace, railway, maritime and automotive industries.

PROSSURANCE offers a comprehensive vision of the process and the quality of the product, following the applicable legislation. Through knowledge-based systems, quantitative methods and modular re-utilisation techniques, it reduces the management of regulatory compliance and (re)certification costs.

PANZER
Nowadays sending information through the Internet is an obligation, making necessary to protect it adequately against cybersecurity threats. Moreover, it is necessary to comply with existing regulations on data protection.

PANZER is a tool that protects data against unauthorised access; moreover, it monitors and records the traceability of documents, providing effective protection for all types of files. The sanitisation of documents is done automatically, not being noticed by the user who does not need specific training to use it.

There is an ever increasing production of software code. Our objective is to innovate and efficiently produce the best software systems.
We believe in a digital world that evolves to become more efficient, friendlier, safer, with better services; in other words, better for society.

Our Offer to Sectors that Design / Develop Software Systems

03. CLOUD TECHNOLOGY

The cloud computing technology is a trend in the IT world that has great potential benefits and which business impact is now beginning to develop for the IT sector itself and for many companies interested in the exploitation of its possibilities. Adopting cloud computing implies new business models based on virtualisation, SaaS (Software as a Service) and/or PaaS (Platform as a Service). This is a complex IT environment in which the success factors require the management of multiple business and technological variables. TECNALIA provides its experience on applied research to international collaboration environments in this field for the migration to this technology to be performed with the boosting competitive advantage.

TECNALIA’s key offer /
• Support methods and tools for the migration to the cloud (SaaS, Software as a Service).
• Re-engineering and reverse engineering tools for the SaaS layer.
• SaaS provision components: security, monitoring and billing.
• Certification models for SaaS providers.
• SLA (Service Level Agreement) verification for suppliers and consumers.
• Safe architectures in the cloud.
• White label PaaS environment (JS, HTML5 & CSS3).

M2CLOUD
A set of tools that allow companies selling software as a product that want to sell software as a service cloud models (SaaS). This is achieved through a three-step plan:
• Pre-migration: by means of decision support tools considering maturity, technical and business levels.
• Migration: through the use of technical transformation and business tools.
• Provisioning, guaranteeing service levels.

Savings, improved efficiency and competitive advantage are driving our companies to bet on the Cloud Technology.
Beyond functionality, rich content and mobility, what really makes a difference and creates a link with the consumer is achieving a unique experience.

Extracting knowledge out of data in order to produce an accurate, effective forecast and to find the best solution for decision-making.

Our Offer to Sectors that Handle Large Data Volumes

01. ANALYTICS AND ARTIFICIAL INTELLIGENCE / SEMANTIC TECHNOLOGIES

The introduction of electronics and software of all kinds is making a world of smart products and solutions possible.

In TECNALIA we can help our clients to create these products and solutions with decisive advantages over their competitors.

And this is possible thanks to the development and management of systems which support experts with a new intelligent way to perceive and to process the knowledge, using the latest technologies in Artificial Intelligence and Semantics.

TECNALIA’s key offer /

• Decision-making support systems.
• Metaheuristic optimisation methods, Artificial Intelligence and Neural Networks.
• Stochastic algorithms for optimization, clustering and grouping data.
• Multi-objective optimization techniques.
• Big Data analytics applications.
• Social web and Linked Data technology applications.
• Unstructured Data integration in Business Intelligence.
• Publishing structured or related data under the Linked Data Paradigm.
• Natural language processing: Sentiment Analysis.

PROLOAD

It is a tool to predict the demand in a determined consumption point. It is apt for the distribution of any utility service: electricity, water and gas, as well as other services such as retail or tourism.

PROLOAD applies different regression techniques to determine the expected consumption in the following hours, and the concept of “similar days” relating the consumption in a similar situation that took place in the past.

SMART MOBILITY LAB

The TECNALIA Smart Mobility Lab provides support for the design of new solutions based on a unique infrastructure that enables rapid prototyping of smart management applications and devices for urban and inter-city traffic.

At the same time the aims to be a meeting point between companies, R&D&I centres and Public Administrations related to traffic and mobility management challenges to identify new business opportunities and their materialisation into new solutions, products and services.
Nowadays, digital services are a field of action for any company or entity. Through communication networks, like portals or on-line services, apps or videogames, through dedicated terminals or points of sale, with machines...

Technology enables new forms of interaction which use the device’s new functionalities while composing contents in innovative ways. Multi-touch technologies, or those used for virtual and augmented reality are some examples.

Moreover, we believe that, in the future, the interaction between services and people will be carried out using not just digital devices or machines, but also using the “embedded” functionality in many more elements of the consumer’s environment.

The success of these digital services depends, very directly, on the “quality of the experience”, even beyond its functionality. With a person-centred design, in which functional and emotional aspects are combined, we want to contribute to the creation of consumers that are engaged in the new digital services, with interaction and usability mechanisms and with the application of new technologies.

01. NATURAL INTERACTION

TECNALIA’s key offer /
- Design of advanced human-machine interaction systems.
- Multi-sensory and multi-surface interaction systems (interaction with any object).
- Virtual reality and augmented reality; virtual 3D environments.
- Interactive art.
- Gamification
- Visual guidance systems.

CHROMAME
Through the use of augmented reality, TECNALIA performs a unique integration between the real and virtual world, merging virtual images on video in real time, which allows you to complete reality with virtual information.

TECNALIA’s key offer /
- Front-ends and platforms for mobile services, apps and videogames.
- Social analysis: Social Mining & Sentiment Analysis.
- Mobile and personal clouds in service super-producer environments.
- Multiplatform development environments for HTML5.
- Asset identification and location.
- Friendly Government & Friendly Tourism solutions.

02. MOBILITY AND SOCIAL

Personalisation in service provision for every aspect of public activity is reflected in the exponential development of social and mobile applications. Creative industries,hotels, companies in the tourism, culture, commerce sectors or even public administration are already successfully exploiting these new channels.

We want to take advantage of the development of this mobile environment so that every company can complement their business by offering new digital services to their usual customers or to the consumer.

We have the technologies and the know-how to increase the presence in the mobile world for all sorts of companies or entities. With a person-centred approach, we contribute to enriching the experience and engaging the consumer of new digital services on communication networks and the internet.

SMART DESTINATION
QING SOLUTIONS is a TECNALIA initiative, originally developed for two hotels of Palladium Group, which offers technology innovation solutions for the tourism sector.

Through our “smart bracelets”, we have created a safe ecosystem for transactions, accesses and identification in a customizable way to enhance the customer’s service experience and for easy integration with information and CRM systems.

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CHROMAME is an Augmented Reality system that integrates within the same application and process the recording, editing, compressing and sending of a video.

During the recording, the user stands in front of a chroma screen and is integrated into a video gag. The user can see himself in real time while a video of a few seconds is recorded. Immediately after the recording, the video is compressed into two qualities (HD and SD) and sent by email to the user.

This system can also be used for photography.

With a person-centred approach, we contribute to maximising the User Experience to get consumers that are enthusiastic about the new Digital Services on the mobile communication networks and internet.
Our Offer to the Digital Services Sectors

03. MANAGEMENT AND PROCESSING OF DIGITAL CONTENT

Technology is completely changing the way audiovisual content is produced, managed and distributed, and even the way it is consumed, which has become a lot more active.

In TECNALIA we believe that technological innovation should be used, above all, to exploit and manage new creativity outlets, and do so with minimal costs.

Or it should be used to adapt the agents strategies to the new consumption/use tendencies, independent of distribution or storage platforms. And to take these new creativity outlets to the new actors in the audiovisual environment.

TECNALIA’s key offer /

- Virtual studios and real and virtual content integration.
- Methods and tools for the engineering, production and exploitation of 2D and 3D digital audiovisual content.
- 360º platforms for TV/Mobile phone/Internet content.
- Automatic 2D/3D graphics generation.
- Smart management of media assets and contents.
- Video analysis and tagging.

CMS (CONTENT MANAGEMENT SYSTEM)

CMS enables the launch of customised advertisement campaigns on multiple devices. Contents, which can be video, images or Flash, are loaded on a server, which establishes the broadcasting schedule and play list for each device.

Depending on the established schedule, the system automatically connects with each device (totem, video wall, information point...) updating and sending contents, while counting the number of content broadcasts of each advertiser.

In a world where services are increasingly provided on digital support systems and with a higher number of smart, interconnected devices and objects, mastering the communication technologies is crucial for the development of our companies and for the progress of the entire society.