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ENERGY AND ENVIRONMENT

TK·gune

Berrikuntza eta Teknologia transferentziarako sarea



BIOTECHNOLOGY, CHEMISTRY AND HEALTH

DIGITALIZATION AND CONNECTIVITY

APPLIED INNOVATION PROJECTS FOR SMALL AND MEDIUM BUSINESSES



TRANSPORT





INDUSTRY 4.0 AND ADVANCED MANUFACTURING

E-COMMERCE, HOSPITALITY AND TOURISM



Tknika

Euskadiko LHren Ikerketa Aplikatuko Zentroa
Centro de Investigación Aplicada de FP Euskadi
Basque VET Applied Research Centre

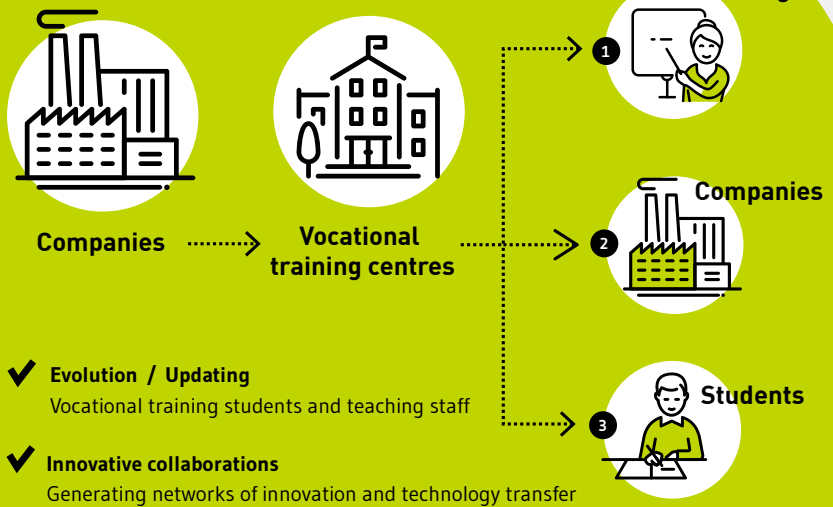
Fp EUSKADI LANBIDE HEZIKETA

EUSKO JAURLARITZA GOBERNO VASCO
HEZKUNTZA SAILA
Lanbide Heziketako Sailburuordetza
DEPARTAMENTO DE EDUCACIÓN
Viceconsejería de Formación Profesional

TKgune is a network formed by vocational training centres to **facilitate the bi-directional transfer of knowledge between centres and companies.**

The goal is to develop **collaboration projects with companies** to respond to the requirement to bring the teaching staff up to date in terms of science and technology, promoting innovation both in small and medium-sized companies and in vocational training centres.

Transfer



- **Evolution / Updating**
  Vocational training students and teaching staff
- **Innovative collaborations**
  Generating networks of innovation and technology transfer
- **Competitive development of small and medium-sized companies**
  driving innovation

What we offer?

1 Assessment for innovation.

We offer organisational assessment adapted to each company's reality, and provide companies with methodological tools to implement innovation plans or creative dynamics.

We support companies when participating in contests for grants related to innovation.

2 Technological innovation and improvement collaboration projects.

We develop innovation and improvement services in collaboration with companies, adapting to their needs. To do this, we take advantage of the potential in each strategic setting, based on the trust provided by working within a network.

How do we work?

1 IDENTIFICATION OF THE COLLABORATION PROJECT

Companies approach the centres, thanks to the pre-existing relationship or We approach companies, offering our services.

WE MEET WITH COMPANIES, WE IDENTIFY THEIR NEEDS AND WE IDENTIFY POSSIBLE PROJECTS FOR COLLABORATION



2 DEFINITION OF THE COLLABORATION PROJECT

A project is specified, to meet the detected needs.

We define the project to be conducted (participants, resources, teams, deadlines, etc.).

A BUDGET IS AGREED UPON AND SIGNED WITH THE COMPANY



3 DEVELOPMENT OF THE COLLABORATION PROJECT

The project is kicked off, with monitoring throughout the entire process.

When both parties meet their commitments, the service is invoiced and concluded.

THE PROJECT IS CLOSED, AND WE ANALYSE COMPLIANCE WITH OBJECTIVES AND THE DEGREE OF SATISFACTION



4 KNOWLEDGE TRANSFER

The collaboration project is disseminated, making the internal and external transfer in the terms agreed with the company.

THE CONTENTS WORKED IN THE PROJECT ARE DISSEMINATED IN THE CENTER, THUS MAKING IT POSSIBLE TO UPDATE THE KNOWLEDGE OF TEACHERS AND STUDENTS.

DISSEMINATION OF THE CONTENTS TO THE COMPANY, TRANSFERING ALL THE KNOWLEDGE ACQUIRED IN THE PROJECT.



Added value for the company

Within the current economic context, driving innovation is essential to guarantee competitiveness for a company. Through its specialised offering, TKgune allows you to improve your products and processes, thus accessing new markets thanks to greater added value.

To this end, we provide you with the equipment and facilities we have in Vocational Training, along with our teachers' expertise, who are specialised in several different areas.

Furthermore, we work with open code, so we have no issue sharing information with the company. In fact, we want the company to learn from the centre, and for the centre to learn from the company.

We should also highlight that the TKgune programme was promoted by the Basque Government Department of Education, in close collaboration with the Provincial Councils of Araba, Biscay and Gipuzkoa. This can open up a wide range of options for your company, competing for grants designed to meet the innovation needs of SMEs.

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Who are we?

58 centres throughout the Basque Country.





Technological areas



TRANSPORT

RAILWAY
AUTOMOTIVE
AERONAUTICS
MARITIME INDUSTRY

- Maintenance process optimisation (augmented reality).
- Assistance with improvement of designs for automotive manufactured components.
- Reverse engineering and manufacturing of 3D prototypes of different components for the aerospace and railway sectors etc.
- Weldability of different materials, robotisation of welding processes, approval of welders. Improvement of cutting and forming processes.



ENERGY AND ENVIRONMENT

CONVENTIONAL ENERGY
RENEWABLE ENERGY + ENERGY EFFICIENCY
SUSTAINABLE CONSTRUCTION

- Recording and analysis of consumption and energy audits.
- Automation, monitoring and control to improve energy efficiency.
- Advice and analysis of different power generation facilities.
- Organisation and control of the operations of chemical processing plants and associated auxiliary services.
- IoT, 3D printing with new materials, topography with drones, etc.



ICT

CREATIVE INDUSTRIES
INFORMATION TECHNOLOGY AND TELECOMMUNICATIONS
CYBERSECURITY

- Virtual reality, augmented reality, extended reality.
- Hyper-realistic 3D scanning (photogrammetry).
- Communications and business computing.
- Security audits, communication networks and computer systems.
- Design of the assembly of safe platforms and control of security systems. Secure code programming.



INDUSTRIAL MACHINERY AND TECHNOLOGY

MACHINE-TOOL
ADDITIVE MANUFACTURING
MECHANICAL MANUFACTURING
FORGING AND STAMPING
AUTOMATION

- Simulation of hot and cold forging processes using the finite element method.
- Machining of metallic materials, graphite etc. for prototyping.
- Scanning for reverse engineering and manufacturing of plastic and metal parts using different technologies.
- Automation of processes and implementation of robotic systems.
- Electronics applied to automated processes.



BIOTECHNOLOGY, CHEMISTRY AND HEALTH

ORTHOPAEDIC PROSTHESIS
BIOPRINTING
GENE THERAPIES
HEALTHY AGEING
MOLECULAR DIAGNOSIS

- Design, manufacture and adaptation of orthoses, prosthetics and support products.
- Improvement of industrial food provision processes.
- Technical solutions to extend the period of staying at home, telecare, adapted furniture, robotic assistance, biosensors and monitoring etc.
- Analysis of production processes to obtain food products with a high differential value.



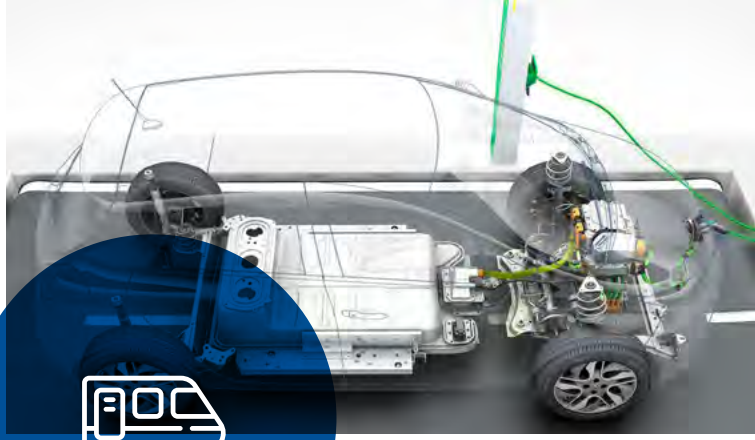
COMMERCE, HOSPITALITY AND TOURISM

E-COMMERCE / MARKETING
TOURISM
GASTRONOMY
HEALTHY FOOD SECURITY

- Design and implementation of the e-commerce online marketing strategy.
- Inventory management: sensorisation, intelligent storage, acquisition of business habits (big data).
- Creation of interactive menus through touch screens taking into account the current diversity of culinary needs.
- Food packaging.

TRANSPORT

RAILWAY / AUTOMOTIVE / AERONAUTICS / MARITIME INDUSTRY







We offer a global vision of all systems, components and elements making up a car:

- **Characteristics of construction, function and regulations for the most recent diesel, petrol and electric engines.**
- **Chassis; design, construction characteristics, passive safety and materials currently used for their manufacture.**
- **Characteristics of all systems and components involved in the vehicle dynamics. Transmission systems, suspension, steering, brakes and active safety systems.**

A vision that helps us to understand how design and manufacturing mode influence every component, with the rest of the systems. This helps us to identify the components and critical elements that directly intervene in the dynamics, safety and reliability of the whole. It also means that solutions and improvements can be applied to both the design process and the process of producing components, sets and subsets.

We offer customized solutions, based on the technical needs of each company. This offer It is aimed both to components manufacturing enterprises and after-sales service (diagnosis, maintenance and vehicle repairs) companies.

Furthermore, our long experience in using and introducing environmental regulations, such as order and cleanliness, will give you a more objective point of view and even a safe platform for starting to work with these new methodologies.

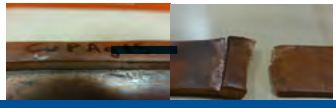
Projects carried out in the field of transport:

MORE PROJECTS:



AUTOMOTIVE

» **INTEGRATION OF TWO BRM ENGINES INTO A BUGGY**
SEG Automotive needs to test the behaviour of some BRMs (British Racing Motors) engines in a used BUGGY, in which the initial structure of the vehicle has to be dismantled and adapted with new mechanical components.



RAILWAY

» **DEVELOPMENT OF AN INSPECTION PROCESS:**
In a company producing railway axles, an inspection process is developed using the following tests (ultrasound, magnetic particles and visual inspection).

» **STREAMLINING OF THE PROGRAMS OF A WELDING ROBOT:**
A company wants to minimise the defects in the parts it manufactures and reduce manufacturing times. To do this, it is necessary to reprogram the welding robots and increase the efficiency of this critical resource up to that point.



MARITIME AND OTHERS

» **DESIGN AND CONSTRUCTION OF SLIDING DEVICES FOR A MARITIME PLATFORM:**
A company needs special equipment to submerge its maritime equipment. For this, sliding devices with a special shape and buoyancy are designed and manufactured.

» **CONSTRUCTION OF A SNOWCAT:**
An adventure company requires a special cargo transport system for extreme winter conditions.



AERONAUTICS

» **DESIGN OF AN AERONAUTICS COMPONENT AND METAL PRINTING THROUGH ADDITIVE MANUFACTURING:**
For an aeronautics company, a new part is designed and manufactured by means of additive printing with metal, for subsequent post-processing and finishing in machining centres.

» **WELDABILITY STUDY FOR COPPER IN DIFFERENT CONDITIONS AND WITH DIFFERENT PARAMETERS:**
A study is carried out for a company that supplies aeronautical components to determine the appropriate parameters of a welding machine in different materials such as copper.

Equipment:

- Lifting equipment, dynamometers
- Steering aligner
- Wheel balancer/tyre changer (passenger cars)
- Plasma cutting machines
- Paint laboratory
- Paint booths
- Welding booths (TIG, MIG, MAG, oxyacetylene and electrical)
- Strobe Lamp - PRE-2324
- Ecoboost direct injection engine
- BMW i3 electric power train (engine, transmission, power electronics)
- Euskelec demo vehicles
- Toyota Prius hybrid vehicle trainer (loan of resources)
- Alecop ADA 307 hybrid and electric vehicle trainer
- Software for the simulation of sheet metal forming processes PAM-STAMP 2G

ENERGY AND ENVIRONMENT

CONVENTIONAL & RENEWABLE ENERGY / SUSTAINABLE CONSTRUCTION







Consumption monitoring, analysis and complete energy audits.

- **We analyse installations from the point of view of energy consumption (invoice analysis, measurement by means of network analysers, etc.), energy consumption monitoring and forecasting, savings measurement and verification.**
- **Taking into account both electrical and thermal points of view we perform energy certifications of buildings, as well as enclosures analysis and suggestions for improvement.**

- We advise on the optimisation of facilities, proposing the integration of renewable energy in existing facilities in order to save money and contribute to protecting the environment.
- We analyse and advise on the construction of new buildings following the new trends in sustainability and energy saving.
- Process improvements based on the Energy Strategy of the Basque Country 2030.



Projects carried out in the field of energy and the environment:

MORE PROJECTS:

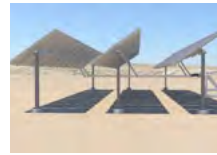
SUSTAINABLE CONSTRUCTION

» **DESIGN OF A HEAT RECOVERY SYSTEM:** Testing and improvements in the control of an air regeneration and recovery system in a 15m^2 room in buildings with ventilated facades.

» **APPLICATION OF CUTTING-EDGE TECHNOLOGY IN TYPICAL PROCESSES AND CONSTRUCTION FACILITIES:** Application of cutting-edge technology in typical processes and construction facilities: thermographic measurements of the air by drone, infiltration measurements, cleaning and detection of possible pipe leaks using robots with micro-cameras, blower door test.







RENEWABLES

» **INSTALLATION OF INDIVIDUAL ELECTRIC SELF-CONSUMPTION IN AN URBAN PARK:** Integral solution for energy production by means of photovoltaic panels connected to an internal network with surpluses and receiving power compensation with a nominal peak of 7.7 KW

» **DESIGN OF THE PHOTOVOLTAIC SOLAR INSTALLATION:** Study of the consumption curve of a cold room and design of the necessary photovoltaic solar installation (both isolated and connected to the grid) to supply it with power. Later training of the customer's teams in the dimensioning of photovoltaic solar installations.

» **INTEGRATION OF A SYSTEM BASED ON IoT TECHNOLOGY** for the measurement of the force exerted by the bolt of a follower.

ENERGY EFFICIENCY

» **ELECTRICITY AUDIT:** Study of the electricity bill and operation of a company with high electricity consumption for its optimisation and the achieving of energy savings.

» **ONLINE MONITORING OF CRITICAL PARAMETERS** (nitrate, ammonia, pH, etc.) for their strict control using IoT technology.

» **ENERGY AND THERMAL AUDIT OF A BUILDING** by studying bills, facilities, occupation, consumption habits and schedules, and also processing of the energy certificate.

Equipment:

- Cold storage installations
- Thermal-imaging cameras, transmittance meters
- Data loggers, ultrasonic flow meters
- Laser thermometer, lux meters
- Wind tunnel, anemometers, tap fittings test bench
- Wood chipper, pelletiser and heat generation
- Passivhaus, insulation, infiltration control
- Teaching equipment for the Smart Home
- Electronic equipment for transfers (Arduino Uno, Mega, Pro Mini, Raspberry Pi, ESP8266, ESP32, panStamp, Photon, Sonoff, etc.)
- IoT home automation control system (lighting, heating, voice and gestures)
- Control platform (Virtual server with openHAB, Z-Wave controllers - USB, Raspberry Pi Z-Wave Gateway - TCP)

ICT

CREATIVE INDUSTRIES / IT AND TELECOMMUNICATIONS / CYBERSECURITY







Within the scope of Information and Communication Technologies offers suggestions to improve and innovate in areas related to 3D animation, virtual reality, company IT systems, multimedia applications and web application development, providing companies with complete facilities where they can conduct all kinds of operational and performance tests.

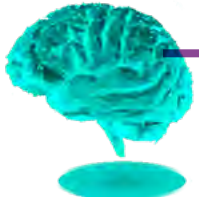
- **In the 3D animation and virtual reality area, proposals for improvement and innovation include 3D animation techniques, modelling, on-screen object virtualisation, revision of archives, code and modelling interactions in 2D and 3D formats, augmented reality, mixed reality, capturing movements through different sensor techniques, environmental recognition and 3D-model printing, from part design to final printing. In this area, we also offer innovative proposals in gamification processes, including assessment, consulting and implementation of the gamified process within the company's structure.**

- In the area of company IT systems and multimedia applications, we include assessment and proposals to improve the implementation and start-up of storage and communication management systems and everything related to network infrastructure and the company's connectivity. We also offer assessment services and improvement proposals for open software-based solutions, including corporate communication platforms, cloud storage, personal publication systems, learning content management, network storage, company connectivity solutions through VPN and Open Source virtualisation.

- We help develop the company's strategic cybersecurity plan: security in the use of active tools and secure design of code in systems and applications.

Projects carried out in the field of ICT:

MORE PROJECTS:



CREATIVE INDUSTRIES

» **GAMIFICATION-BASE APPLICATION FOR IMPROVED AUTISM DETECTION IN MILISECONDS:**
By testing with this application, an evaluation of the skills of the sick person is made, and from the result, a specific training is designed to improve those skills.



» **DESIGN OF AN AUGMENTED REALITY APPLICATION**
3D visualization on touch screen of the map of Bilbao with the most representative buildings where RKL Integral has performed. Dynamically present the technological solutions installed in these buildings

IT AND TELECOMMUNICATIONS

» **DESIGN OF AN IT SOLUTION** for an entrepreneurial company dedicated to personal physical preparation.

» **USE OF CUTTING-EDGE TECHNOLOGY IN THE CONSTRUCTION OF BUILDINGS:**
Creation of the BIM model of the HIKA Txakolindegia terrain and building from drone photogrammetry.

» **OPEN-SOURCE SOLUTIONS FOR COMPANIES:**
Integration of the Moodle platform with Big Blue Button, implementation on a dedicated VPS server and transfer of the WordPress platform to the new server.



INFORMÁTICA Y TELECOMUNICACIONES

» **DEVELOPMENT OF AN IMMERSIVE APPLICATION**
Application to virtually visualise a dance performance: digital platform in which the viewer from his screen enjoys an immersive, unique and personalized experience of the performance.

» **ADAPTATION OF AN INTERNAL COMBUSTION ENGINE FOR TEACHING PURPOSES:**
At the request of a company that produces components for the automotive sector, the most important components of an internal combustion engine that they produce themselves have been identified, incorporating optical indicators controlled through a computer application, while also displaying multimedia content on a screen.

Equipment:

- SimSpray paint simulator
- Soldamatic welding simulator
- Tower crane simulator
- Optical motion capture system
- Inertial motion capture system
- Virtual reality headsets and sensors from leading manufacturers: HTC VIVE and Oculus RIFT
- Optical and inertial motion sensors
- Mixed reality headsets, Microsoft HoloLens
- 3D printers
- Wiring qualification and certification equipment
- Fibre optic fusion and certification equipment
- Radio-relay communication systems
- VSAT communication systems
- IP telephony
- Virtualised DPC with different Windows and Linux servers in production
- UTM system with firewall, routing, anti-spam, anti-malware and other functions
- Server-based antivirus system
- Data backup systems
- Cybersecurity laboratory
- Simulators to create digital twins (Simumatik 3D, Ciros, etc.)

INDUSTRIAL MACHINERY AND TECHNOLOGY

MACHINE-TOOL / ADDITIVE MANUFACTURING / MECHANICAL MANUFACTURING / FORGING AND STAMPING / AUTOMATION







The growing demand and evolution of the manufacturing processes along with the integration of the new technologies of Industry 4.0 into the market, with the Additive Manufacturing as one of the fundamental pillars, provide the machine tool industry and its users with a wide range of design and production possibilities.

Using automation, additive manufacturing and the advantages of process simulators, you will be able to test and produce prototypes and materials, optimise manufacturing processes and carry out industrialisation tests, manufacturing pre-production versions of new products.

In view of the growing requirements and evolution of manufacturing processes, the TKgune team of engineers can help you to analyse your existing processes, suggesting and performing actions to achieve improvement, reduce manufacturing time, adapt machines, etc. We can also simulate alternative operations and processes to avoid interference with your production line and can analyse the results to confirm or reject hypotheses.

Furthermore, we can help you to consider, design and test completely innovative processes (Digital Twin). TKgune can therefore carry out the preliminary study, including the appropriate tests to confirm the efficacy and stability of the new alternative.

Projects carried out in the field of industrial machinery and technology:



SOLDADURA

» **WELDABILITY STUDY OF ALUMINUM ALLOYS:** Solution for a research chamber with aluminum alloys from the point of view of weldability.



AUTOMATION

» **DESIGN, MANUFACTURE AND ASSEMBLY OF AN AUTOMATED APPARATUS FOR THE PERFORATION AND SEALING OF A COVER:**
In response to the requirement of the company for the automating of the perforation process of the plastic cover and the subsequent heat-sealing of the special filter, the design, manufacture and assembly of an automated apparatus that performs the perforation and sealing of the cover has been carried out.

» **DESIGN AND MANUFACTURE OF A MACHINE IN A MOULDING PROCESS:**
Due to the health problems that can be caused to workers when manually removing the wedges from a mould, a new machine has been designed and manufactured to automate the process.

» **DESIGN OF THE AUTOMATION OF THE TRANSFER OF A PART FROM ONE PLACE TO ANOTHER:**
In a machine press in the automotive industry, the transfer from one station to another of the part produced by cold stamping is designed so that it is synchronised with the timing of the press.

FORGING AND STAMPING

» **VALIDATION OF THE FORGING TOOL FOR AN AUTOMOTIVE COMPONENT THROUGH FEM SIMULATION.** The stresses and the distribution of forces arising in the forging process have been evaluated for the design of the tool produced by the company to assess the suitability of the design.



MORE PROJECTS:

ADDITIVE MANUFACTURING

» **DESIGN AND MANUFACTURE OF A MOLD BY ADDITIVE MANUFACTURING BY INFUSION OF RESINS FOR THE MANUFACTURE OF FUNCTIONAL PARTS.**



5-AXIS MACHINING

» **5-AXIS MACHINING** of a part for the rear brake of a bicycle.

Equipment:

MECHANICAL MANUFACTURING

- Multitasking machinery
- Conventional machinery (lathes, milling machines, etc.)
- 3, 4, and 5-axis machining and turning centres
- Grinding machines and EDM
- CAD, CAM, CAE design software

METROLOGY AND TESTING LABORATORY

- Three-dimensional machines (Mcosmos, Pc-dmis, Calypso, etc.)
- Visual measurement machines and scanner equipment
- DT equipment (hardness, strength, etc.)
- NDT equipment (ultrasound, thermal-imaging camera - FLIR E50Bx, etc.)
- Materials and composites laboratories
- Vibration analysis machine

AUTOMATION

- PLCs: Siemens, Omron, Schneider
- Robots: ABB, KUKA, MITSUBISHI, FANUC, STAUBLI, ROBOTINO, etc.
- Collaborative robots, universal robots
- Pneumatics and proportional hydraulics
- Multiple programming/simulation software
- Omron, Siemens and Cognex vision cameras
- Omron, Siemens, Schneider, Magelis, Beijer, Proface screens

FORGING AND STAMPING

- Software for the simulation of metal alloy moulding processes
- Simulation of forming processes
- Hot and cold forging machines

BIOTECHNOLOGY, CHEMISTRY AND HEALTH

ORTHOPAEDIC PROSTHESIS / BIOPRINTING / GENE THERAPIES / HEALTHY AGEING / MOLECULAR DIAGNOSIS







The Basque Country is committed to sustainable human growth. In this growth, society, the environment, culture and economy are not separate, but are interconnected.

Sustainability is the paradigm for planning a future that seeks a balance between environmental, social and economic aspects in order to achieve better quality of life.

Vocational training plays a fundamental role in sustainable human development and, within the framework of a production model based on the efficient use of existing resources, it will be carried out in a comprehensive and integrated way to support the sustainable economy that we must build both for our own benefit and for future generations.

The food industry offers an opportunity for innovation adapted to the needs of current functional products. Probiotic foods and active components are being used to help treat health problems such as hypertension, hypercholesterolemia, diabetes and allergies, etc.

The TKgune network of centres will allow you to propose and test different technical solutions in three areas: ageing (telecare, adapted furniture, robotic assistance, biosensors); food (food traceability, new product development); and biosciences (anatomical models, prostheses, implants, etc.).

Projects carried out in the field of biotechnology and health:

HEALTHY AGEING

» **ENCOURAGEMENT, MOTIVATION AND IMPROVEMENT IN THE QUALITY OF LIFE FOR THE THIRD AGE.**

» **DEVELOPMENT OF AN APPLICATION FOR POSTURAL CORRECTION:**
Development of an application that recognises and analyses body posture and suggests exercises to improve it. It offers the option of individualised attention.

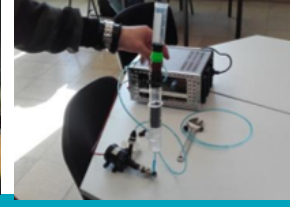
GASTRONOMY

» **OPTIMIZATION OF THE CRAFT MANUFACTURING PROCESS OF BOGA BEER:**
Collaboration with the company Boga Euskal-Garagardoa, to measure the degree of alcohol in certain samples in the laboratories of the Zabalburu school.

» **CREATION OF HEALTHY SNACKS** from the residues of a manufacturing process. The result is a food product consisting of 100% protein, better preserved and more convenient for carrying while travelling.

» **PRODUCT IMPROVEMENT** from the use of natural raw materials and eliminating a number of additives that increase the body's glucose intake.





MORE PROJECTS:

HEALTH / BIOSCIENCES

» **BUILDING A PROTOTYPE OF A BIO MANUFACTURING PRINTER:**
Bioprinting is a technique that is revolutionizing medicine today. This technology allows to create several cellular structures using the techniques of biocompatible polymer structures, or also the most complex layer by layer, from a bioink composed of stem cells. Its objective is the development of 3D organs adapted to the patient.

» **DESIGN AND MANUFACTURE OF PASSIVE PROSTHESES IN SPECIAL MATERIAL AND FINISHES:**
A company needs help to manufacture passive prostheses in cases of tibial amputations by 3D printing using materials suitable for orthopaedic prosthesis.

» **DESIGN AND PARAMETERISATION OF ORTHOPAEDIC PROSTHESIS MATERIAL:**
After various adjustment problems with high-end fittings and knees, an orthopaedic specialist needs help to design and produce her own custom-parameterised orthopaedic prostheses.

Equipment:

Instrumental analysis laboratory

» GC/FID: quantification of organic molecules in volatilisable matrices

» AAS: quantification of elements in liquid samples

» UV/VIS spectrophotometer: quantification and analysis of chromophores in liquid samples

Complete nutritional analysis instrumentation:

» Kjeldahl digester

» Buchi distiller

» Soxhlet extractor

» Drying oven

» Flask, instruments for volumetric titrations, etc.

Instruments for physicochemical characterisation of samples:

» Determination of viscosity (rotational, Engler, etc.)

» Melting point (Buchi)

» Density (densitometers, pycnometers)

» Refractive index (Abbe)

» Rotation power (digital polarimeter), etc.

Instruments for conventional microbiological techniques.

Nucleic acid and protein amplification and electrophoresis instruments:

» Conventional thermal cycler

» Dishes and cuvettes for horizontal and vertical electrophoresis

» Heat blocks for restriction with enzymes, etc.

Tools for the identification and classification of micro-organisms, identification of species in food and environmental samples

3D FDM printers (resins, jewellery, dental implants and ceramics, etc.)

Orthopaedic prosthesis product workshops

COMMERCE, HOSPITALITY AND TOURISM

E-COMMERCE-MARKETING / TOURISM / GASTRONOMY / HEALTHY FOOD SECURITY







Times are changing and nowadays companies have to adapt to new sales techniques, adapting to the needs of their customers and creating new forms of communication.

These have led to the design of new apps for the management of sales channels, digital marketing and e-commerce, using dynamic web pages in the case of B2B and B2C and using big data in sales.

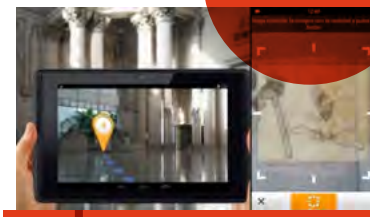
Digitisation and global technological transformation favour the continued growth of electronic commerce.

The Vocational Training centres of the Tkgune network help us to advise on improving your company in online marketing strategies in the following areas:

- Creation of innovative applications, internationalisation, promotion of the company and digitisation of sales.
- Supply in electronic commerce and improving the relationship with suppliers.
- Logistics and inventory management through the integration of 4.0 tools.
- Introduction of new digital tools for hospitality, such as POS (Point Of Sale), modular platforms that facilitate business control through advanced and multi-platform digitisation.

Projects carried out in the field of commerce, hospitality and tourism:

MORE PROJECTS:

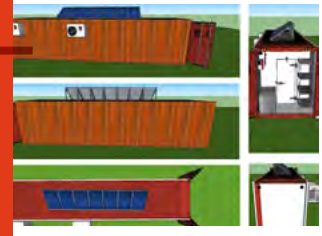


HOSPITALITY

» **MARINE CONTAINER FOR MUSHROOM PRODUCTION**
Retrofitting of a marine container for mushroom production

» **CREATING HEALTHY EDIBLE PRODUCTS: JAKION JAMS**
The Hospitality School of Artxanda (Bilbo) together with the company JAKION collaborate in a project to create and promote healthier jams

» **DESIGN OF A SMART DEVICE:**
A kitchen appliance has been designed so that when the restaurateur uses a digital screen to select the food that they want the appliance to prepare, it will self-program and cook this under the conditions specified in a cookbook.





TOURISM

» **DESIGN OF AN AUGMENTED REALITY APPLICATION FOR THE ARCHAEOLOGICAL MUSEUM OF BILBAO:**
Design of an Augmented Reality Application that allows the visitor to interact with the environment of the Archaeological Museum of Bilbao through mobile devices, creating an entertaining, interactive and educational guide mode

» **DESIGN OF POSTER FOR POINT OF SALE:** Ad hoc training on the Canva platform, 24 h campaign media plan for a company dedicated to tourism.

E-COMMERCE

» **IDENTIFICATION OF POSSIBLE IMPROVEMENTS** to the website (such as safe browsing).

» **DESIGN THE MARKETING STRATEGY** in social media for a company.

» **DESIGN OF DIGITAL SALES PLATFORMS:**
in order to sell "zero-kilometre" products today, a digital buying and selling platform has been created for use by agricultural producers and final consumers.

Equipment:

» Virtual reality headsets and sensors from leading manufacturers, HTC VIVE and Oculus RIFT
» Mixed reality headsets, Microsoft HoloLens
» 3D printers
» POS or management software for different devices
» Managers for virtual shops: PrestaShop, Magento, WooCommerce, Odoo POS, etc.

All of the equipment:

TRANSPORT

- Lifting equipment, dynamometers
- Steering aligner
- Wheel balancer/tyre changer (passenger cars)
- Plasma cutting machines
- Paint laboratory
- Paint booths
- Welding booths (TIG, MIG, MAG, oxyacetylene and electrical)
- Strobe Lamp - PRE-2324
- Ecoboost direct injection engine
- BMW i3 electric power train (engine, transmission, power electronics)
- Euskelec demo vehicles
- Toyota Prius hybrid vehicle trainer (loan of resources)
- Alecop ADA 307 hybrid and electric vehicle trainer
- Software for the simulation of sheet metal forming processes PAM-STAMP 2G

COMMERCE, HOSPITALITY AND TOURISM

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ENERGY AND ENVIRONMENT

- Cold storage installations
- Thermal-imaging cameras, transmittance meters
- Data loggers, ultrasonic flow meters
- Laser thermometer, lux meters
- Wind tunnel, anemometers, tap fittings test bench
- Wood chipper, pelletiser and heat generation
- Passivhaus, insulation, infiltration control
- Teaching equipment for the Smart Home
- Electronic equipment for transfers (Arduino Uno, Mega, Pro Mini, Raspberry Pi, ESP8266, ESP32, panStamp, Photon, Sonoff, etc.)
- IoT home automation control system (lighting, heating, voice and gestures)
- Control platform (Virtual server with openHAB, Z-Wave controllers - USB, Raspberry Pi Z-Wave Gateway - TCP)
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ICT

- SimSpray paint simulator
- Soldamatic welding simulator
- Tower crane simulator
- Optical motion capture system
- Inertial motion capture system
- Virtual reality headsets and sensors from leading manufacturers: HTC VIVE and Oculus RIFT
- Optical and inertial motion sensors
- Mixed reality headsets, Microsoft HoloLens
- 3D printers
- Wiring qualification and certification equipment
- Fibre optic fusion and certification equipment
- Radio-relay communication systems
- VSAT communication systems
- IP telephony
- Virtualised DPC with different Windows and Linux servers in production
- UTM system with firewall, routing, anti-spam, anti-malware and other functions
- Server-based antivirus system
- Data backup systems
- Cybersecurity laboratory
- Simulators to create digital twins (Simumatik 3D, Ciros, etc.)

INDUSTRIAL MACHINERY AND TECHNOLOGY

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ADDITIVE MANUFACTURING

- Laser cladding additive manufacturing in metal (ADDITOLA)
- EINSCAN-PRO structured light scanner
- Metal Studio Binder jetting additive manufacturing (DESKTOP)
- Altair topology optimisation software, Solid Edge Generative Design and NX
- Jet Fusion 3D 4200 additive manufacturing (HP)
- 3D printer (Sicnova JCR)

Additive Manufacturing with non-metallic materials:

- Strong thermoplastic PA12, PLA, ABS, PETG, PVA, ASA+
- ALBA 300, 3D additive manufacturing machine using SLM technology