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HOW **DIGITALIZATION** CAN HELP THE **ENVIRONMENT**

DigitalES, the Spanish Association for Digitization, represents the principal companies in Spain's digital technology and innovation industry. The goal of **DigitalES** is to foster the digital transformation of citizens, companies and public authorities, thereby contributing to the economic and social growth, as well as environmental sustainability of our society.

At **DigitalES**, we are convinced that technology and constant innovation are an almost inexhaustible source of advantages and benefits for sustainable development. Our objective is the development and diffusion of our member companies' research, development and innovation in areas such as sustainability and the environmental protection.

In this document we summarize some of our member companies' projects related to how digitization can help the environment, classifying them into three categories according to the scope of their application:

- REDUCING EMISSIONS
- ENVIRONMENTAL PROTECTION
- ENERGY EFFICIENCY

01. REDUCING EMISSIONS_

COMPANY: ERICSSON
TITLE: EINRIDE: REDUCTION OF EMISSIONS IN THE TRANSPORT SECTOR
SCOPE OF APPLICATION: TRANSPORT

Description

Fossil fuel-powered transport is a major contributor to global emissions, as well as a safety hazard on the road.

Ericsson has joined up with its partners to co-create a safer and more sustainable transportation ecosystem using 5G to connect fully electric and automated vehicles.

Ericsson, Telia and Einride are creating a significantly more sustainable transport ecosystem by connecting electric, autonomous vehicles; reduction or elimination of harmful emissions.

5G is a key enabler of sustainable transport providing the connectivity and reliability needed to safely introduce autonomous trucks onto public roads. Ericsson's Cloud Core for 5G powers the first commercial installation of Einride's Autonomous Electric Transportation (AET) system.

Einride, Ericsson and Telia are putting 5G into motion at a DB Schenker facility in Jönköping, Sweden. The goal is to power an all-electric, autonomous transport ecosystem that takes fleet management to the next level.

Results obtained

- Switching to electric vehicles can reduce CO2 emissions from a logistics network by 90 percent. Additionally, commercial driverless vehicles mean less downtime, more reliability and higher overall profitability, as well as healthier air quality and sustainable cities.

Video:
https://www.ericsson.com/en/cases/2019/reducing-transportation-emissions

COMPANY: ALTRAN
TITLE: ECONOX
SCOPE OF APPLICATION: REDUCE CO2 EMISSIONS

Description

EcoNOx is a system developed by Altran to optimize the emissions of nitrogen oxides from vehicles with combustion engines.

Current regulations standardize pollutant emissions under very specific test conditions. However, various studies have shown that both driving characteristics and external environmental conditions can significantly alter these emissions.

EcoNOx consists of a network of sensors installed in the vehicle that monitors emissions, environmental conditions, different parameters of the combustion engine and driving. This data is received and processed by an electronic switchboard that, via Bluetooth, sends a series of data to a special touch interface, developed by Altran, located next to the driver.

To develop ecoNOx, they combine cutting-edge technologies such as the Internet of Things and vehicle connection to the cloud or Big Data. Data, as well as game dynamics (e.g. path scores), can be centralized in a web app that reflects statistics and maps.

Results obtained

- Tests carried out on the prototype vehicle demonstrated the importance of various driving factors that affect NOx emissions. Using the ecoNOx system, it has been verified that the level of emissions can be reduced by up to 88%.

Video:
https://www.youtube.com/watch?v=C5m_BQqhQpc

Company: MÁSMÓVIL Group
Scope of application: Reducing pollution

Description

MASMOVIL Group has installed a connectivity device that turns its employees' vehicle into a smart car.

Additionally, the Group installs remote measurement devices for polluting emissions and CO_2 at its headquarter entrances and, through an application, notifies employees if their emissions are in accordance with the emissions approved for their respective vehicles.

Subsequently, if these emissions exceed those approved, the employee will receive proposals for measures to be implemented with the help of the company to reduce emissions that contribute to improving air quality and climate change.

Additionally, they will carry out a characterization of the emissions of the fleet to quantify the overall reduction of the company by this initiative and to know if there is any generic problem that is manageable by the group.

Results obtained

• Polluting emissions control (HC, NOx, CO_2, CO and particles) of all the MASMOVIL Group employees' vehicles.

• Reduction of emissions from those vehicles identified as large emitters of the MASMOVIL Group.

• Awareness of the employees of the MASMOVIL Group on respect for the environment and the emissions that they produce.
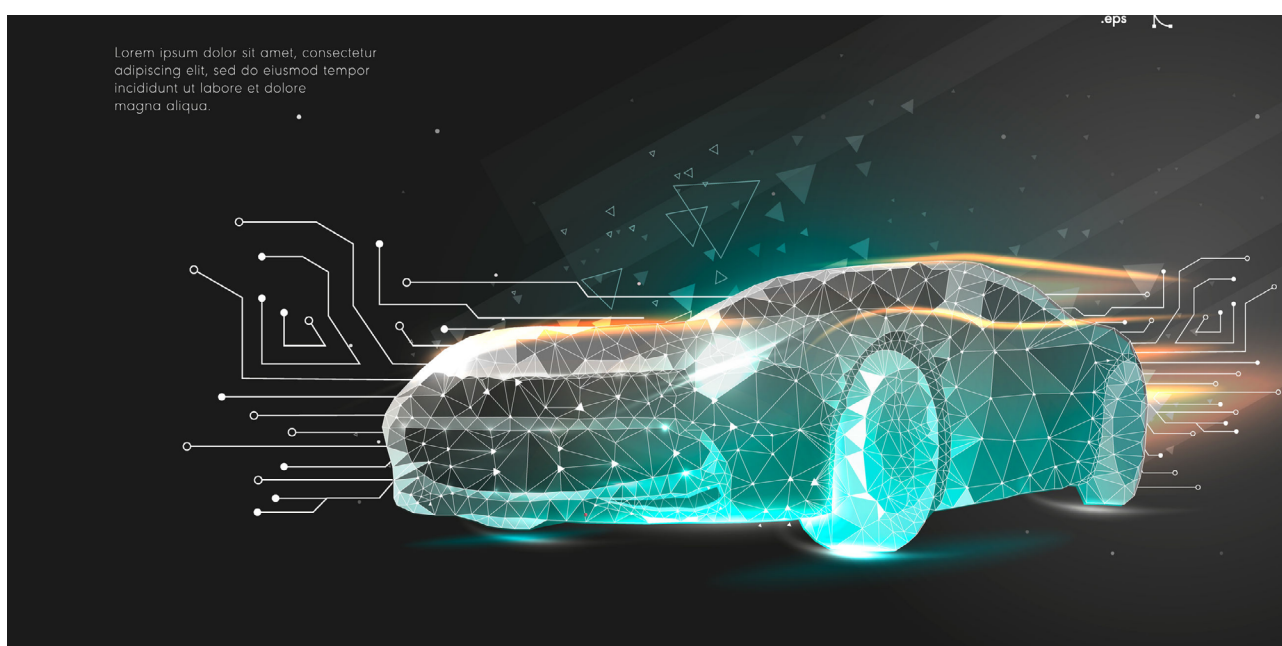
02. ENVIRONMENTAL PROTECTION_

Company: Company: Fujitsu
Title: Fujitsu Digital Owl
Scope of application: Fauna

Description

Fujitsu Digital Owl is a solution that combines the use of autonomous drones together with image recognition and artificial intelligence solutions applied to the recognition of species in extinction in natural areas of difficult access.

The solution is in production in Australia in the Goulburn River National Park and with it saving our species knows better the patterns of animal and plant species that wants to protect and prevent their survival.

The observation of hundreds of images obtained by autonomous drones is analyzed with the help of artificial intelligence efficiently, saving time and money, since the use of helicopters to observe an area of such difficult access is reduced to almost zero. In addition, with this technology, many more images and data can be obtained, which are subsequently analyzed, providing transcendental information to studies of both plant and animal species.

The solution, therefore, has allowed us to improve the study of threatened species, avoid dangerous expeditions to the park and save CO_2 emissions into the atmosphere.

Results obtained

- Better protection for native endangered species

- Improving the efficiency of the work done by SoS in the National Park

- Valuable information about the behavior patterns of both the species to be protected and the invasive species

- Reduction of CO_2 and other greenhouse gas emissions by eliminating manned helicopter expeditions

- Cost reduction of man and fuel hours (higher cost of the organization)

- Reduction of the risk of occupational accidents by scientists due to the need to travel large, dangerous or inaccessible areas on foot

- Continuous improvement in the entire protection process thanks to the application of AI in constant learning.

Company: Nokia
Title: 5g used for monitoring blue-green algae in the Baltic sea.
Scope of application: Flora

Description

The blue-green algae situation was monitored with a drone and computer vision in a trial in Kirkkonummi, Finland. The camera and sensor-equipped drone was flown over the Baltic Sea, and the high-resolution video was transmitted over 5G for real-time analysis.

Blue-green algae monitoring is based on multiple sources of information, including satellite imagery and automated chlorophyll measurements from ferries sailing the Baltic Sea. This data is combined with local visual observations made at the shoreline. In the trial in Kirkkonummi, the drones operated over a wide area outside the line of sight, and the information was transferred in real time to computer vision. Under good conditions, computer vision detected blue-green algae with over 90 percent accuracy.

Drone-shot video, fast connections and real-time AI-driven data analysis in data centers offer significant new opportunities for environmental monitoring. Besides blue-green algae, drones can be used to track the spread of plastic waste or locate oil leaks. Timely information adds to the situational awareness of the environment specialists and researchers and helps to make quick decisions to prevent environmental hazards.

Results obtained

- **End-to-end solution.** The complete solution comprises Nokia drones and optional equipment, private and secure mobile broadband, cloud connectivity, a Command & Control center and an optional docking station

- **Drones for different mission.** You can automate multiple drones for various individual missions. Fleets of drones can efficiently cover large areas collecting data and information in the event of unplanned emergencies, or as part of scheduled flights for specific industrial needs.

- **Aerial insight.** High definition and/or thermal video streams can be provided with/without analytics. Data is collected and analyzed on-board or in the control center and turned into meaningful information.

- **Security.** Thanks to the high performance and low latency connection, any sensor information from the drones can be securely and confidentially transferred or processed in the ultra-scalable edge cloud.

Video:
https://www.youtube.com/watch?v=KFYp8Q0JWmQ

Company: Milanuncios (Adevinta)
Scope of application: Environmental sustainability

Description

Annual study carried out by Milanuncios, to promote the collaborative economy, demonstrate the commitment to caring for the environment and raise awareness about the importance of responsible consumption.

This report measures the environmental benefit of buying and selling second-hand products on Milanuncios, based on the premise that each item sold replaces the production of a new equivalent, as well as the management of the waste of said product.

Taking into account everything that has been sold on the platform over the course of a year, and in collaboration with the Swedish Environmental Research Institute (IVL), they can calculate the potential savings in carbon dioxide emissions and how much plastic, Aluminum and steel – highly polluting materials - have been discontinued. As an example, in 2018 the potential savings in CO2 emissions was 1.7 million tons. In addition, 827,000 tons of steel, 113,000 tons of plastic and 75,000 tons of aluminum were saved.

Results obtained

- If we look at the study presented in 2019, its presence in the media has managed to reach an audience of 23.4 million people and its economic value in advertising investment is equivalent to €353,000.

Company: Berocam
Title: Challenge: Do you know your impact on the environment?
Scope of application: Environmental sustainability

Description

Berocam is carrying out an internal project to raise awareness among the people who are part of the company about the impact of their daily activities on the environment.

To do this, they have developed an application in which they select, using a survey mode, the activities that contribute to improving the environment, as they are carried out throughout the day.

This application is connected in real time to a dashboard that indicates what positive impacts these efforts have on the carbon footprint, etc. Through a combination of various technologies, the data can be processed in real time to form conclusions.

At the end of the day-month, each person can know their contribution to the environment through simple activities that berocam promotes. It is also possible to know how Berocam, globally, has a positive impact and its history.

Results obtained

The results obtained are divided into two levels:

- **Business:** identifies the actions that the company can contribute to improve the environment. Conclusions such as: Allow telecommuting, acquisition of water source to eliminate plastic bottles, acquisition of cups to avoid the use of plastic cups, among others.

- **Personnel:** the survey works as a means of dissemination so that you know the ways that exist to reduce the environmental impact. In addition, changes in personal habits are adopted, such as reducing meat consumption, using the anti-plastic resources provided by the company, opting for telework, among others.

Environmental
sustainability

Company: Ericsson
Title: Increasing the efficiency of port operations
Scope of application: 5G connectivity

Description

Ericsson is deploying a pilot project based on enhanced 5G and Augmented Reality (AR) technology in the port of Livorno. 5G connectivity has allowed for more efficient loading and Tuscany Livorno Port plays the most important role as gateway to exchange goods.

The Livorno initiative is part of the 5G Corealis technological project, a pan-European EU Commission project addressing digital transformation in ports with final aim to secure competitiveness and sustainability. In Livorno the benefits were measured towards the UN SDGs.

5G also enabled advanced services such as environmental monitoring, intelligent logistics and mobility, leading to energy savings.

Ericsson's connectivity and sustainability expertise in the smart port initiative at Livorno, Italy, has been highlighted to the United Nations' Sustainable Development Solutions Network (UN SDSN) as an example of how the UN's Sustainable Development Goals (SDGs) are being advanced.

Results obtained

- With 5G communications and AR, Ericsson has increased the port's efficiency by minimizing the transit time of goods.

- It has also decreased pollution and using information in real time has resulted in a safer workplace.

- Loading and unloading operations have sped up and, as a result, has reduced idle time for ships because of the enhanced logistics, improved productivity, competitiveness and has enabled growth for the territory.

Company: Vodafone
Title: Smart Water City
Scope of application: Water resource management

Description

The project improves the efficient water performance of the city of Gandía using the latest technology to analyze the use of the water supply network, identifying patterns and providing proactive information that enables the use of this resource to be optimized in real time.

Regarding the distribution of water, the solution reduces the volume of water that must be injected into the drinking water distribution network, and therefore the energy required to purify and inject the water into the network.

Citizens will be able to detect internal leaks and receive alerts about consumption in empty apartments, such as, in vacation residencies. Via a mobile application, they can check their hourly water consumption and receive alarms about incidents.

Results obtained

- The volume of water that needs to be sanitized is reduced and its management can be better planned. The results of the project are greater sustainability and lower energy consumption.

Company: QUINT
Title: Iberostar PaperLess
Scope of application: Paper recycling

Description

The hotel group decides to undertake an ambitious project to digitize the back-office processes with the aim of reducing paper and facilitating digital access to information. The pilot project, aimed at some of the hotels that make up the Group's flagship, has reduced paper consumption by 79%.

Likewise, it entails a significant reduction in the tons of wood and water consumption necessary in the paper generation process. The effort is part of the Iberostar Group's commitment to promoting a responsible tourism model, a pioneering initiative that the Group is promoting through its 'Wave of Change' movement.

The Group seeks to reduce its carbon footprint through innovation and the digitization and automation of its processes, thus reducing their environmental impact.

Results obtained

- The result obtained was a 79% reduction in paper consumption in all the back-office processes and operations of each hotel. Extrapolating these data to the group of hotels of the Iberostar Group in Spain, the results of paper savings reach more than 3 million sheets per year, equivalent to 450 trees. At the same time, by avoiding the entire paper creation process, in which there is usually a high consumption of water and electricity, Quint and the Iberostar Group, managed to reduce the environmental impact of its activity, with magnitudes of savings estimated at more than 850,000 liters of water and 177,000 kWh of electricity.

Company: IBM
Scope of application: Multiple

Description

IBM applies technology directly on topics such as energy efficiency or climate change, among others.

The digital transformation of our business and our clients' businesses is improving the degree to which we can examine and address global environmental challenges. Today, we can do some extraordinary things by extracting value from data using analytics, blockchain, the Internet of Things, Artificial Intelligence, and the cloud. This is specified in the following projects:

- IBM is already protecting freshwater (freshwater),IBM (NYSE: IBM) and The Weather Company, an IBM Business, launched Forecast: Change, a new initiative to help combat freshwater scarcity in communities around the world. This change Initiative provides resources in support of actions that are designed to help address the lack of freshwater access around the world.

- IBM recently partnered with a Portuguese company, Compta Emerging Business, to create a new fire detection product using Artificial Intelligence, Internet of Things, and The Weather Company to more effectively detect and fight fires. quickly and efficiently, and even calculate the probability of a fire before it occurs.

- Innovation in materials science can also pave the way for more sustainable Information and Communication Technology devices: IBM recently designed a new chemistry for a new battery that does not use heavy metals or other substances with supply problems. This discovery has significant potential for electric vehicle batteries, for example, where concerns such as flammability, cost and charging time come into play.

Company: ORANGE
Title: Power Features
Scope of application: Energy

Description

It consists of a system by which they turn off the equipment connected to the antennas while they are not being used, similar to when home users use an automatic shutdown setting with electronic devices in their homes when they are not in use.

This project is simple to explain in concept, but it has a huge technical complexity having been developed in collaboration with other multinationals such as Ericsson or Huawei and allowing a reduction of energy consumption in the equipment of our network of around 20%.

In fact, they include in the project the energy saving initiatives of our general service buildings and our own stores where they have specific projects to manage energy efficiency.

Results obtained

- 20% reduction in energy consumption in telecommunications equipment.

Company: Accenture
Title: Iberostar Intelligent climate: at the service of people
Scope of application: Energy

Description

Currently, energy is a scarce commodity and comfort in the workplace a must for organizations. For this reason, an intelligent solution, based on the latest technologies, that would help them manage and control the electricity consumption of the HVAC equipment in offices, is needed. In 2018, they implemented a comprehensive solution at Liquid Studio Madrid that uses the latest Internet of Things (IoT) and artificial intelligence (AI) technologies: Intelligent Climate.

This solution is a unique and scalable asset, thanks to the use of real-time data, integration with building control systems, the incorporation of weather forecasts and wireless communications, as well as the use of 100% cloud environments.

Results obtained

- After a year of its implementation, Liquid Studio has saved 8% in energy consumption. Currently, the company is working on the implementation of this system in the offices of La Finca 2 and 10 (Madrid), La Rotonda (Barcelona) and in the X.0 Industry Center (Bilbao).

Company: Telefónica
Title: Smart cities
Scope of application: Smart cities

Description

Telefónica is participating in the most smart city projects in Europe, helping these cities to become pioneers in various areas from sustainability and mobility to security and citizen services all greatly improving the way citizens live and work. Telefónica is working in cities including Santander, Barcelona, Zaragoza, Malaga, Logroño, Seville and Valencia, alongside various local corporations and other businesses in different areas to make the concept of "smart cities" a reality.

Under the slogan 'one city, hundreds of possibilities', Telefónica demonstrated a variety of different projects that it is currently working on in this space. For example:

- Since October 2014, Telefónica has been working on a project in Logroño to centralise traffic, street lighting and the 010 citizen information helpline public services, feeding the information into a smart city platform named Plataforma Smart, which was also on show in Barcelona.

- Telefónica's smart city work in Valencia is the first project awarded in Spain that is designed according to the specifications and standards laid out by the European Union's Future Internet (FI-WARE) architecture. Telefonica's smart cities platform enables Valencia to undergo the process of transformation of urban services and apply open data policies that favour the establishment of open and participatory innovation processes.

- In Zaragoza, in collaboration with the local transport consortium, Telefónica has begun to implement the "Smart Steps" platform. The project consists of extracting and analysing data, on an anonymous and aggregated basis, in order to learn more about population movements allowing relevant bodies to optimise transport through smart planning to provide citizens with better and more efficient services.

Other initiatives that Telefónica presented during the Smart Cities Expo was the management pilot of street lighting by the Malaga local council, the solution for energy efficiency in buildings with the government of Cantabria, the Open Data platform by the Santander city council, and a transport NFC payments platform developed by the Asturias Transport Consortium.

Results obtained

- Telefónica's Smart Cities platform has managed to promote the digitization of cities by reducing energy consumption by 24% and water consumption by 15%.

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