TOY

HI TOY

HI TOY USES A GAMES CONTEXT LIKE THAT OF RADIO-CONTROLLED MODELS TO DEMONSTRATE THE CONCEPTS ON WHICH THE INTERNET OF THINGS (IOT) IS BASED, AND THE POTENTIAL OF THE HI REPLY PLATFORM.

USING THE HARDWARE AND SOFTWARE COMPONENTS OF THE HI REPLY PLATFORM, HI TOY CAN, FOR EXAMPLE, TRANSFORM A QUADRICOPTER DRONE OR A MODEL CAR INTO TRUE SMART OBJECTS, LINKED TO THE NETWORK.

WITH HI TOY THE USER CAN PILOT THE MODELS AND RECEIVE DATA FROM THEIR SENSORS, USING A SIMPLE SMARTPHONE. THE RAW DATA FROM THE SENSORS (TEMPERATURE, HEIGHT) AND ACTUATORS (PWM SIGNALS SENT TO THE SERVO CONTROLLERS OF THE MODELS) IS EXPOSED THROUGH WEB SERVICES. ONCE RECOVERED, THE DATA IS MADE AVAILABLE ON THE NETWORK AND HELPS TO ENHANCE THE DIGITAL LAYER IN WHICH THE MODELS (SMART OBJECTS) HAVE BEEN ENTERED.

THE ELEMENTS OF THE HI REPLY PLATFORM USED IN HI TOY CAN BE APPLIED TO A WIDE RANGE OF VERY DIFFERENT SCENARIOS: SURVEILLANCE OF AREAS FOR CIVIL PROTECTION PURPOSES, SECURITY MONITORING OF IMPORTANT BUILDINGS AND STRUCTURES, TRAFFIC CONTROL IN URBAN AREAS, AUTOMATION OF SERVICES FOR THE CITY, AND TOURISM, ETC.

INTRODUCTION

The Internet of Things is the next stage in the evolution of the communication paradigm currently provided by the Internet. Up until now, the devices connected had to be homogeneous, but with the Internet of Things it is now possible to link up heterogeneous devices. Indeed, the Internet of the future is making it possible to connect machines and devices that differ significantly from each other, and to reprocess and translate heterogeneous data into services used to exchange information on the network via Web Services.

The Reply Research and Development centre dedicated to the Internet of Things **(IoT)** – and to the Internet of Services **(IoS)** - has created **HI Reply**, an innovative platform featuring services, devices and middleware, which bypasses the limits imposed on users by other solutions currently available on the market. The main characteristics of HI Reply are pervasivity, transparency, inter-operability, flexibility, sensitivity to the context in which it is applied, and a capacity to self-adapt and self-configure. HI Reply offers a basis on which to develop new specific applications for vertical scenarios, for example the **Automation** and **Control** sectors.

HI TOY

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HI Toy transforms a common object such as the smartphone into a radio controller for piloting a model quadricopter or car. The smartphone runs an application that uses a Wi-Fi signal to connect to the HI Reply platform Smart Object mounted on the model.

The gyroscope on the smartphone is used to pilot the model intuitively and according to standards (Web Services). The features of the on-board Smart Object are:

▶ Wi-Fi connectivity.

▶ Use of the DPWS (Device Profile for Web Service) Stack to communicate with other nodes or with BackEnd applications.

▶ Scalable Hardware and Software architecture with a small footprint and low energy consumption.

▶ Ultrasonic temperature and proximity sensors.

▶ Video camera mounted on board the model that sends video footage to the Smart Phone during movement.

▶ PWM (Pulse Width Modulation) outputs to enable the device to communicate with the servo controllers on board the model being piloted.
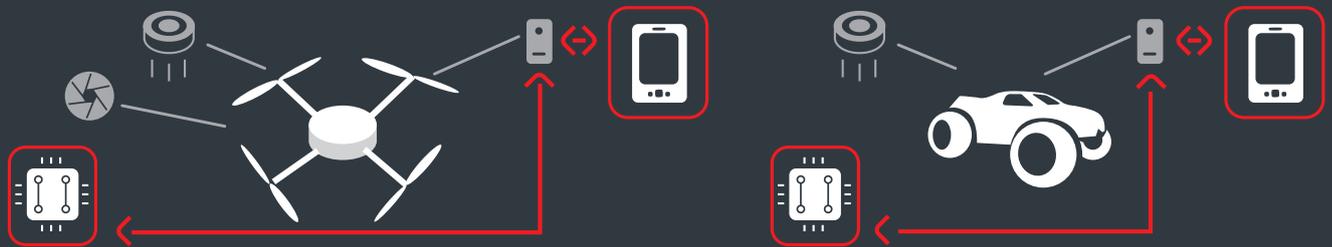
FUNCTIONALITY AND STRONG POINTS

The features of the HI Reply platform make the application easy and quick to create on the smartphone, and enable the auto discovery and registration of Smart Objects so that they can use its services.

WHEN USING THE RADIO-CONTROLLED APPLICATION ON THE SMARTPHONE THE USER CAN:

▶ Move the model backwards and forwards by tipping the smartphone back and forth (the quicker it is moved the steeper the angle).

▶ Turn the model to the left and to the right by moving the smartphone in the same direction.

▶ Read the display of the helicopter's altitude.

▶ Read the temperature recorded by the sensor on board the model.

Video streamed from the camera mounted on board the model can be displayed on any node in the network, using a device fitted with a Wi-Fi connection (Smartphone, Tablet, PC, etc.)

Unlike other point-to-point solutions on the market, HI Reply makes it possible for HI Toy to enable a large number of objects to use its services simultaneously.

FURTHER APPLICATION SCENARIOS

The technologies and modules designed by Reply on which the HI Toy demonstrator is based enable IoT and IoS applications to be created in a wide range of application scenarios such as **area surveillance** for civil protection purposes, **monitoring of important buildings** and **structures, traffic control** in urban areas, **security services** for both places and people, the **automation of services** for the city and tourism. Other applications that can be added to these include those that use the same technology to provide solutions for domotic home automation (domestic robotics — the control and activation of domestic appliances).

REPLY

www.reply.eu

HI Reply is an innovative platform created by Reply, which incorporates services, devices and middleware for the Internet of Things. HI Reply creates an ecosystem of people, objects and services that communicate via the network. HI Reply uses sectional, configurable modules to provide all the elements necessary for the creation of vertical solutions that are secure, scalable and flexible, and based on the interaction and cooperation of connected objects.