Connected bike-sharing

The future is exciting.

Ready?

vodafone

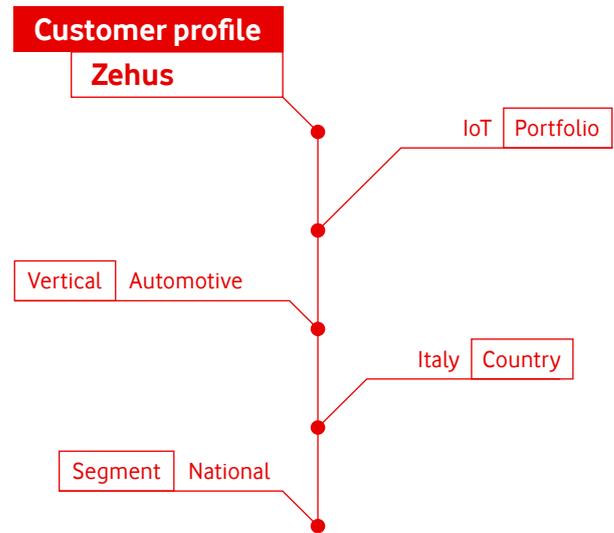# Pedal-assisted bikes communicate with cities and users via the cloud

Using services based on Vodafone IoT connectivity together with Vodafone Automotive on-board technology and service platform, Zehus has developed a proposal for implementing a bike-sharing service which is unique in Europe. Free-floating pedal-assisted bit**ride** bikes will transmit data that can be used to improve the service, in addition to information regarding traffic, road conditions and pollution.

The challenge

It all starts with a smart wheel

Pedal-assisted e-bikes are becoming increasingly popular, both for private use and as part of bike-sharing services, in cities all over the world. Many of these bikes (including all of those used by bike-sharing platforms) are also connected, enabling geo-location, locking/unlocking and usage monitoring for calculating charges. Zehus, founded in Milan as a spin-off company of the Politecnico di Milano Department of Electronics, entered this market in 2013 with a simple yet brilliant idea: place all the components of an e-bike into a hub: battery, motor, sensors, electronic circuits and the communication apparatus that transmits and receives data.

"In our early years as a start-up," recalls Marcello Segato, CEO of Zehus, "we dedicated ourselves to developing the single component that would dramatically simplify the process of developing a pedal-assisted bike, targeting the vehicle manufacturing sector. In 2016, after observing the rising trend of bike-sharing, we also decided to target this market, given that we had a technologically successful concept. In 2017, we began to develop the connected bike, seeking a partner that not only had the technology and service, but also the right mentality to embark on a fascinating yet complex process."

Customer profile

Zehus

IoT | Portfolio

Vertical | Automotive

Italy | Country

Segment | National

The solution

A shared vision

From the first meeting, Zehus' management team knew that they had found a partner with significant experience in Vodafone. As well as the ability to supply on-board technology, service delivery platform and connectivity, Vodafone also shared the same vision in relation to smart mobility.

"Compared to standard connected pedal-assisted bikes," explains Segato, "the bikes developed with our technology collect, process and transmit far more data. As a result, they need an IoT platform which is more like that of a car. For this reason, in addition to our realisation that Vodafone is very focused on providing bike-sharing services, we began to work together, not only on the implementation of the Vodafone IoT service and technology on the first 400 bikes in the bit**ride** service (used in the test phase for Milan Municipal Authority), but also on the development of the connected bike of the future."

We chose Vodafone IoT because this multinational company is clearly more organised and motivated than other operators in relation to the Internet of Things.

Marcello Segato
CEO, Zehus

Thanks to the transmission apparatus equipped with Vodafone Automotive technology integrated into the pinion of the wheel, the bike transmits the GPS location to identify the bike, calculate the route, the cycling time and speed, as well as locking and unlocking the bike at the start and end of the service. "The settings related to cycling, seven different values that are measured 100 times a second, are also used to optimise recharging and the battery's use of electrical energy, in order to maintain a constant charge of between 40% and 80%, reducing the need to use charging stations," explains Segato.

With a shared vision, Zehus and Vodafone IoT are working together on matters relating to technology and services, as well as the business model and commercial proposal to be submitted to municipal authorities throughout Europe, potentially representing hundreds of thousands of connected bikes.

"Once the data is collected and sent to the cloud," explains Segato, "it can be processed to extract useful information for bike-sharing service managers, municipal authorities, and citizens. For example, data relating to road conditions or pollution, made possible by adding an extra sensor, not to mention traffic. In the future, there will be an integrated approach to mobility, in this case via innovative pedal-assisted bikes, which will allow bike-sharing service managers, via a monitoring dashboard and, more generally, a cloud-based data transmission and processing service, to offer value added services that go far beyond transporting users from one part of a city to another."

The merging of Zehus and Vodafone IoT lines of development, Vodafone's experience in the automotive market and the multinational's strong presence and expertise within Italy have formed the basis for a partnership which is destined to go far in the European smart mobility market.

Why Vodafone?

- Vodafone supplies Zehus with the electronics, connectivity and cloud infrastructure required to implement the bit**ride** service in an efficient manner

- Zehus is not only able to identify the bike's location, but also how it is being used and the environmental conditions along the route

- This information can be used by the bike-sharing service manager to improve the service, as well as by users to improve their travel experience

About Zehus

Zehus was founded in 2013, as a spin-off company of the Politecnico di Milano Department of Electronics. In February 2017, Zehus partnered with Vodafone and began developing a bike-sharing platform (bit**ride**) aimed at European cities.

- www.zehus.it

With its vision of an interconnected future, Vodafone IoT has unparalleled expertise in the smart mobility sector and in the field of data security.

Marcello Segato
CEO, Zehus

Business site

Case studies