# IOT SYSTEM TO MONITOR THE WELL-BEING OF SENIOR CITIZENS WHO SELF-ISOLATE DURING THE PANDEMIC

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The **wearable** device is a LoRa node equipped with a combination of an **accelerometer** and **gyroscope** sensor, combined with an AI algorithm to detect if the user has fallen with minimal false positives.

This will allow to minimize the consequences of falls in the elderly, by **automatically** detecting it and **notifying the caregivers** with minimal delay.
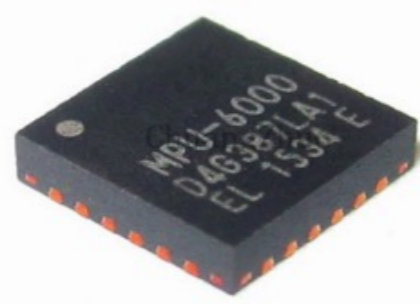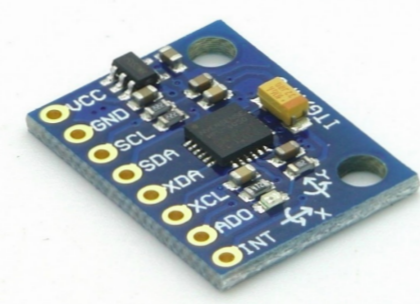
The telecommunication system is **LoRa Wan** based, to make the connection between the IoT wearable device and the Application server. This architecture use secure LoRa Technology (Node – Gateway) and TCP/IP Network (Gateway – TTN-Application Server).

The Application Server receive **payload encrypted** messages from **TTN server** and runs all the software required (Node-Red, SQLite, Dashboards) to store, process and generate alerts information according to received information.
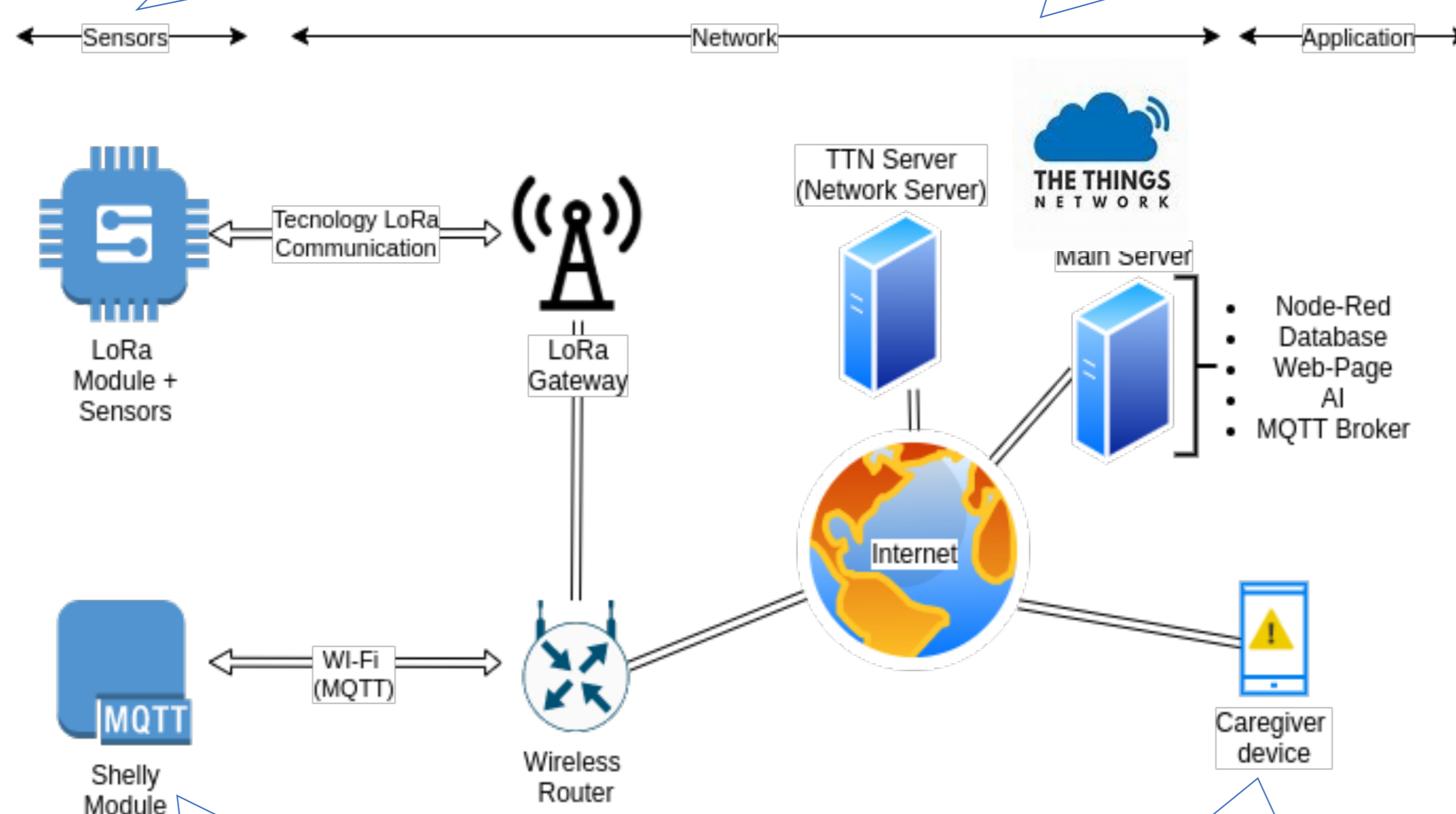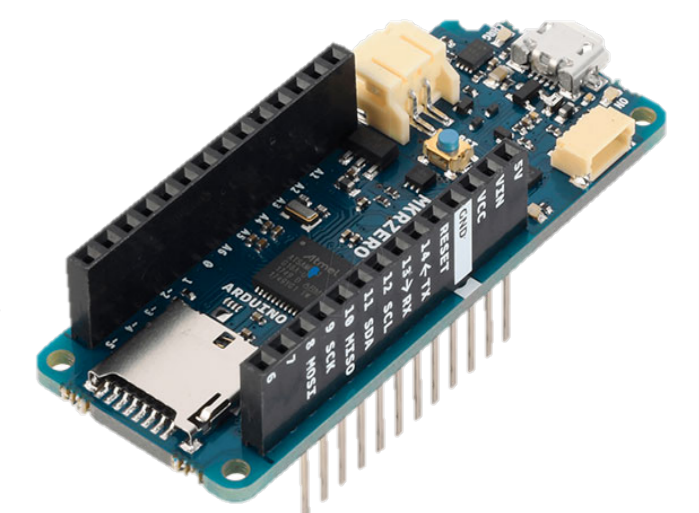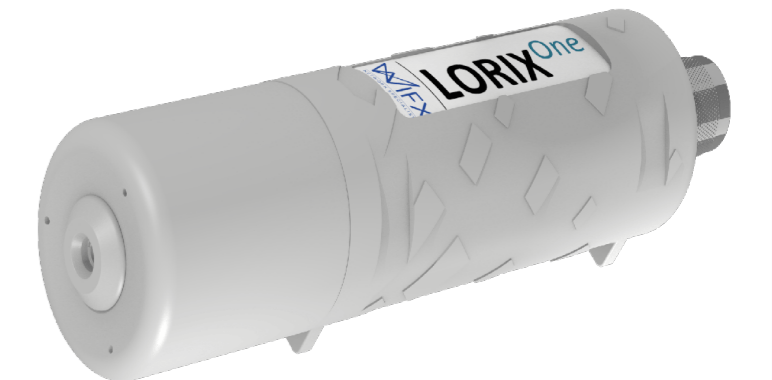
The main goal is to monitor the **power consumption** of each electrical appliances related to each user's daily activity. Message Queuing Telemetry Transport (**MQTT**) protocol over Wi-Fi, is used to send data to a server where the information is processed and stored. When the **low-power device** identifies an abnormal situation, such as the user has fallen or the **AI algorithm** detect a change in the person's energy consumption, it creates an **alert**. The alert is sent to a family member or caregiver through either the mobile app or by SMS or email.
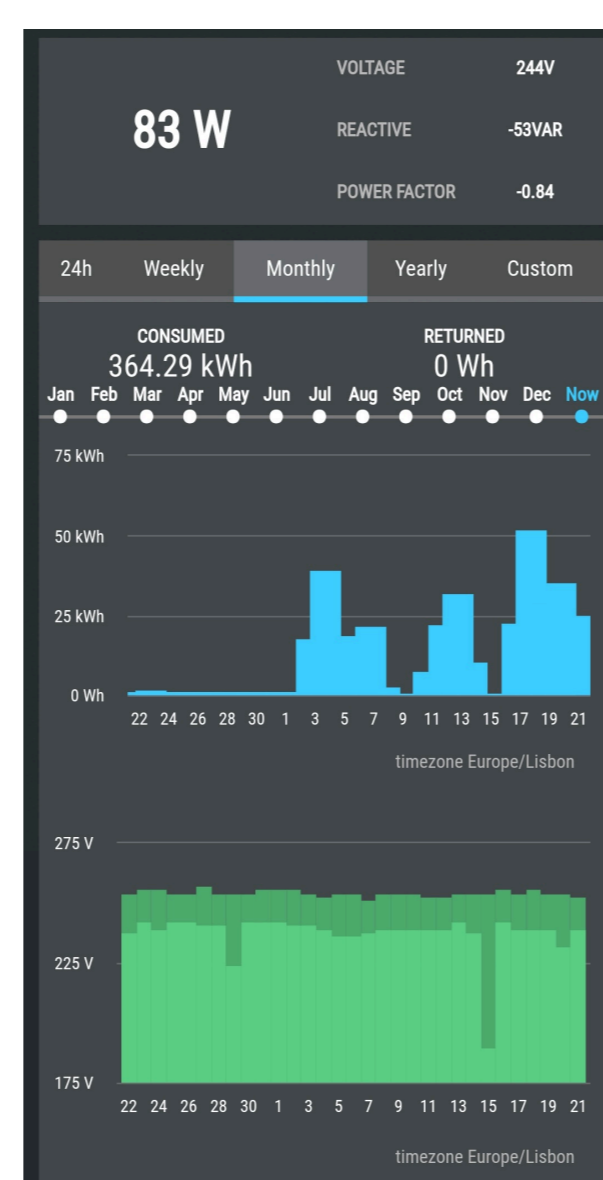
Aging is a natural, continuous and inevitable process, guided by losses and gains.

Inevitably, changes occur at the biological and psychosocial level that led to an increased risk of falling in this age group.

Geographic isolation, particularly in times of **pandemic**, is one of the main risk factors for **falls** without timely assistance.

Future work includes additional field tests and the development of a final **marketable** product.

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EUCNC 2021 June 8-11
European Conference on Networks and Communications | Porto, Portugal