

# Supporting Circular Economy with IoT

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## **Abstract**

Driving force for WEEE (Waste Electrical and Electronic Equipment) management has never been more important than it is today in order to save global resources and to reach the bold goal in EU for circular economy (European Green Deal). Recycling is seen as real business not only in companies focusing on recycling and material management, but also in companies that sell consumer electronics.

This paper describes a project, which developed a concept for an IoT solution to support recycling of electronic equipment. The project was a part of CEDIM (Circular Economy Digital Marketplace) project funded by Helsinki-Uusimaa Regional Council to develop a digital marketplace for WEEE in Finland.

The goal for this project was to develop and implement a prototype of a system used to receive electrical equipment for recycling in circular economy entry point. Developed solution is based on combination of RFID technology and computer vision to provide automated identification and assessment of condition of the equipment and registration of the equipment to a digital market place. The entry points operate as MQTT brokers, which publish the information to digital market place. MQTT was chosen due it is lightweight protocol optimizing also the use of resources in communication. At this phase, the focus of the project is in ICT equipment and public schools in Finland.

## **Keywords**

Circular economy, MQTT, RFID, computer vision