

Internet of Things for Circular Economy, design of a Pay-per-Use smart PSS eco-system



This thesis explores how Internet of Things (IoT) can support Circular Economy in its goal of decoupling economic development from finite resources consumption. This is made specifically in the context of products as services, using as the case of study the Pay-per-Use washing-machine service by startup company HOMIE. The machine is connected to HOMIE's database through a tracker that sends the data of users' consumption so that they are charged accordingly.

However, product-as-services rely on the service provider as the main actor for product circulation. The product use per use, as an intensive resource consumption part of the lifecycle, and its relationship with users' decisions is not therein contemplated. So, design strategies for sustainable behavior are included in the development of this product service system (PSS) as a complementary concept to Circular Economy.

This study found out that smart products have a special relation with sustainable behavior strategies, since connectivity enables in great extent the design of eco-interactions, which can be used to reduce the environmental impact during the use phase. Additionally, IoT is considered itself a source of value creation, which can be used in development of service features that, by means of connectivity, solve issues that were not tackled before. Thus, more attractive value propositions can be created.

These findings were translated in a design for the case of study. The final design is a Smart PSSs eco-system integrated by 3 devices: the webpage, the washing machine interface and an app. All together aim to improve the experience of use of HOMIE's Pay-per-Use service while fostering more sustainable practices and motivating adoption. Therefore, they are built with a strong sustainable behavior design rationale.



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