Case Design Sheet

1. CASE DESCRIPTION

TITLE: Conceptual case: batteries as a service

PARTNER	LOCATION	TIME/DURATION
BOC	-	-

2. DIGITAL TRANSFORMATION CHALLENGE

2.1. BUSINESS TRANSFORMATION

Both consumers and companies are using large number of various batteries. Traditionally batteries are sold either as a part of a product or independently, used and after they are no longer usable disposed of (which is also an important concern due to the dangers caused by batteries thrown into water or into the garbage (environmental sustainability).

High quality batteries have longer life and higher capacity, but their cost is exponentially higher than cheaper batteries with shorter time of life. Possible solution for this problem is a digital service for providing, exchanging and decomposing for renewal the batteries in line with the circular economy approach. Instead of selling batteries, company could offer a service for a monthly rent.

The service would include elements such as:
- last mile logistics
- individual customer interactions (payments etc.)
- producing new batteries on a basis of used ones (urban mining approach, but without allowing the batteries go to waste)

2.2. CONCEPTUAL TRANSFORMATION

Apart from a change of business model for a company this approach requires several aspects of conceptual transformation such as:
- support for last mile logistics (deciding upon technology and cooperation modes)
- enabling IoT infrastructure for monitoring batteries in locations where they are used
- enabling fleet management

Since this is a complex scenario, various types of models need to be used to design, run and improve the system such as BPMN diagrams for processes, DMN for business rules, EAM models (like Archimate) for enterprise architecture of the IoT solution and possibly Petri Nets.

2.2. TECHNICAL TRANSFORMATION

Batteries as a service scenario which is supposed to offer to the customer smooth and flexible experience requires sound IoT solution, so that each battery can know and communicate its status. Smart environment of a battery must enable the communication. Software systems (possibly using

AI/ML or business rules) should calculate optimal moment when a battery needs to be exchanged. Obviously, the battery exchange must be technically possible in a smart environment.
In addition a system for managing individual interactions with customers is needed.

3. SOLUTION

Individual Customer Management System includes a personalized setup of the smart environment. Depending on the individual customer setup the last mile logistic can range from pick-up boxes, delivery on time, to the provision of maintenance services.
Individual Customer Management provides a set of standard packages to (a) register – using online certification, (b) Service Fee calculation and payment management as well as (c) Service Provision and SLA monitoring.
Business Process Management is used for Individual Customer Management, Petri-Nets are used for last mile logistic, EAM is used and extended to manage IoT and smart environment, Analysis, Simulations and Data Mining in combination with Decision Management is used for Fleet Management.
Battery extensions that measure the capacity and the corresponding communication terminal is provided for rent that are provided and maintained as part of the service offering. Data are centralized collected, a corresponding battery Cockpit enables the fleet management. Depending on the smart environment the battery is provided by (i) pick-up, (ii) delivery on time, (iii) pick-up boxes or (iv) full maintenance in a smart environment.

4. KEY SKILLS AND COMPETENCES

- Selecting right mode of last mile logistics and urban mining (operation vs cooperation)
- Shift of mentality from a manufacturing company to a service provider with an individual customer management
- Smart Environment and IoT Conceptualization and operation
- Fleet Management of batteries using data-driven optimization approaches