



# CUSTOM8

Belgium, [www.custom8.be](http://www.custom8.be)

By joining an industry platform, an SME was invited to participate in a government-funded, multi-partner research project through which it acquired new technical skills

## Executive Summary

A university spin off, Custom8, participated in a large open innovation project with some 10 partners (research institutes and companies). The project was partly subsidized by a governmental organization and named NXT\_SLEEP. The aim of the project was to investigate an innovative way to monitor sleep disorders that can be done remotely (not necessarily in a hospital setting). A working prototype was realized as a result. Custom8 gained essential expertise that was relevant for further product development and management purposes. However, no joint commercialization took place with the other partners at the end of the project.

CASE N° : SD41

SECTOR:HEALTHCARE

TECH INTENSITY: HIGH-TECH

LIFE CYCLE STAGE: ESTABLISHED

INNOVATION VECTORS: PRODUCT

01 PARTNERS: PSR, LARGE CORPORATION, OTHER SME, LEAD USERS/CUSTOMERS

KEYWORDS: Subsidized open innovation programme, multiple partners, sleep monitoring, sensor, community

- BACKGROUND FRAMEWORK
- INNOVATION CHALLENGE & MARKET OPPORTUNITIES
- OI TRAJECTORY
- BUSINESS IMPACT
- LESSONS LEARNED



## BACKGROUND

Customs is a spin-off company of the KU Leuven (Catholic University of Leuven, Belgium). It was spun off in 2001 from the biomechanics department of the university with the ambition to develop products for body measurement systems. At the start, the scope of potential business was very broad – products that could measure a variety of body parameters with a focus on ergonomics. Later, it was decided to focus in particular on sleep patterns.

In future, Customs intends to extend its business with additional product lines dedicated to B2C. Currently they are in the B2B business only.

## INNOVATION CHALLENGE & MARKET OPPORTUNITIES

Customs was faced with the challenge of moving from a research to a product-based business. Initially, they had a research platform – a mattress to research and measure moisture and temperature during sleep. Based on their expertise they wanted to develop a commercial product – a mattress that could monitor sleep patterns.

Customs spotted a market opportunity in 'telemedicine' solutions for monitoring sleep disorders outside a hospital setting.

More than 5% of the population suffers from some kind of sleep apnoea – i.e. pauses in breathing during one's sleep. Sleep apnoea not only jeopardizes the quality of a person's sleep, but also has a negative impact on their cardiovascular system. Furthermore, besides the issue of sleep apnoea, medical doctors have also noticed that many lung and respiratory diseases become worse during sleep. It is therefore critically important that both sleep apnoea and other sleep-related breathing disorders are accurately diagnosed, treated and monitored.

Today, this is done through traditional medical examinations such as a polysomnography – a complex and cumbersome examination that has to be carried out in a hospital, and that is therefore not scalable. Moreover, demographics in Western countries are changing rapidly, threatening hospitals' capacity to meet the growing demand for healthcare support. New approaches to healthcare are therefore required, approaches that

allow certain pathologies to be monitored outside the hospital.

## OPEN INNOVATION TRAJECTORY

### Concept development

The essential elements of the concept were identified as follows:

- Simple and user-friendly, both for the patients and the nursing staff (through the use of advanced, wireless, off-body sensors);
- For remote use (at home), for use on a larger scale (treating larger groups of patients), and for use during a longer period of time (encompassing initial screening, monitoring and follow-up);
- Can also be used for complex pathologies (tracking more complex parameters).

The project "NXT\_SLEEP" was initiated to develop the concept further. Some 10 partners joined the project. They had got to know each other through the VOKA health community, a networking group around healthcare. In addition to Customs, the other partners included NXP, Bekaert textiles (sleep textiles), the hospital of Antwerp, IMEC, fifthplay, Sensotiss and several other research groups.

### The development process, IPR and competition strategy

The development process was driven by three desired outcomes:

1. A set of new, advanced sensors that are easier to use by patients and nursing personnel.
2. A data communication platform that gathers, synchronizes and transmits sensor data in a secure way.
3. A data processing platform that leverages advanced algorithms.

Customs participated in the development of an advanced sensor set. It consisted of built-in (off-body) mattress sensors that measure respiratory movement, temperature and moisture. The project was split into three phases: research phase, prototyping and testing phase.

Working with ten partners around three different outcomes was complex. Meetings were held with

the full consortium every 1-2 months, when only top-level issues were discussed (not detailed problems). During each phase project members worked together in small groups. They relied on each other to gather data. The partners turned out to be more active and engaged when working in smaller groups. At the end of the project a working prototype was presented.

There was an agreement about IP before, during and after the project. The IP agreement was suggested by the ICON project funders. This facilitated the cooperation.

The competition strategy consisted of providing a new approach to existing medical processes with higher flexibility, reduced costs and complexity – a remote solution for use at home compared with existing hospital-based solutions.

## **Commercialization and follow-up**

The 2-year project was an ambitious time-frame to fine-tune the required research and build a prototype. The ultimate goal was to commercialize the outcome, but this proved to be impossible in the given time-frame. The complex partner structure proved to be challenging for setting up the right revenue model and defining a shared business vision.

In future, Customs might manage to reach the commercialization stage of this development.

## **BUSINESS IMPACT**

The outcome of the open innovation collaboration consisted of a working prototype and improved technical skills for the SME.

The company learned how to work on achieving technical improvements and bringing the improved product to market.

In terms of impact of their business, the project helped set up a new product development track to launch commercial solutions on the market. It also provided access to a new market and healthcare network.

## **LESSONS LEARNED**

An open innovation research project offers a way for an SME to develop in-depth new product offerings. For an SME alone it is not feasible to

carry out intensive and costly research, which can limit their opportunities in terms of the novelty of the product. Government-subsidized open innovation research projects, on the other hand, make it possible.

### Main lessons learned:

1. Being part of an industry platform or any kind of networking event is important for getting to know possible partners.
2. Intermediaries are well placed to initiate open innovation projects.
3. A high number of partners can be a barrier to fast and efficient work. Too many partners (10 in this case) lead to delays in work (waiting for the results of others to proceed) and a lack of trust.
4. In the case of a large group of partners, it is useful to have break-out working groups to facilitate more open communication and more efficient working methods.
5. It is important to have a joint commercialization vision already at the beginning of the collaboration.