



INTELESENS

United Kingdom, intelezens.com

While developing their medical device, a university spin-off engages regularly with doctors and patients in order to validate the solution and relies on a large company to assist them with roll-out and commercialization

Executive Summary

Intelesens is a spin-off company from the University of Ulster that provides intelligent healthcare monitoring for regular users to operate at home. In its innovation process, the SME engages with users, experts, and practitioners in order to design and improve the product. It has also engaged with large firms in order to obtain assistance with finance and marketing in general.

CASE N°: UKI46

SECTOR: MEDICAL TECHNOLOGIES

TECH INTENSITY: HIGH-TECH

LIFE CYCLE STAGE: ESTABLISHED

INNOVATION VECTORS: PRODUCT, CUSTOMERS & MARKETING, DISTRIBUTION CHANNELS

OI PARTNERS: PSR, LARGE CORPORATION, INDIVIDUAL EXPERTS, LEAD USERS/ CUSTOMERS

KEYWORDS: University research, spinoff, medical industry, users

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

intelezens)
RESPONSIVE HEALTHCARE

BACKGROUND

James McLaughlin is the director of the Engineering Research Institute at Ulster University. The research centre works on bioengineering and specializes in cardiovascular products. Many of the technologies developed at the research centre have become spin-offs, with Intelesens being one of many. The company Intelesens currently employs 40 people and its main product is a wireless sensor system that monitors arrhythmias and respiratory patterns then alerts a doctor if the algorithm detects any anomalies.

The company and the technology are 15 years old, but the market for medical-grade wearables has not yet taken off. The main focus is to expand on sales and take the technology to the global market by hopefully engaging with larger firms.

INNOVATION CHALLENGE & MARKET OPPORTUNITIES

The concept for the product was developed as a result of work being carried out at the Engineering Research Institute at Ulster University. Based on previous work they were able to identify the need for small and portable monitoring equipment that patients could use at home. Intelesens then worked closely with cardiologists and patients to develop the solution through constant feedback. The product addressed two main needs: the patients' needs and socio-economic needs. The patients' needs were to have a reliable and robust monitoring system that they can use in order to have a better lifestyle. In terms of the socio-economic impact, it means that these patients can stay at home and free up valuable resources at health centres.

The main market need was the socio-economic impact that the product would have on health services. The health service would be able to see the value in adopting this technology as it would allow patients to be monitored at home and therefore free up beds and other resources in the hospital. In addition, there was also a gap in the market for a robust and accurate device that would accurately monitor vital health statistics without the danger of having any false positives. Intelesens's algorithms have improved over the last five years to become some of the most accurate in the industry.

OPEN INNOVATION TRAJECTORY

Concept development

The product concept was developed in-house at the research centre, but it was validated during its development phase by local doctors and other experts. The idea of having a remote monitoring system for patients to use has been around for some time, and other people had tried to develop something similar. It was not entirely a unique idea, but it was one that the director of research was keen to work on. What makes Intelesens different, however, is the robustness that their algorithms lend to the product, thereby guaranteeing it a higher level of accuracy.

The development process, IPR and competition strategy

While developing the product, Intelesens regularly engaged with doctors and patients in order to validate the solution. At the same time, however, they have a diverse board of directors that can help give advice in a number of areas, such as commercialization and finance. Most board members also have a significant amount of experience working in industry for large technology companies.

In the medical technology industry, there is a wide range of regulations that firms have to navigate. Intelesens therefore took advice from local regulatory agents that have previous experience obtaining approval from either the American FDA or the European CE. Intelesens used SoS and UL as their regulatory agents whose feedback led to a further tweaking of the design in order to obtain approval.

The device went through approximately 20 iterations before they got it right. Most of these changes came as a result of information they obtained from doctors, patients, regulatory agents and manufacturers.

Intelesens focus on selling the monitoring system themselves, but they also receive some minor revenue from licensing some of the IP they have generated. They license mainly the algorithms but plan to expand their licensing programme more in the future.

The unique selling point of the product is its robustness and accuracy, which sets Intelesens products apart from their competitors. For the last five years, Intelesens has developed highly

accurate and robust algorithms to detect anomalies in the data.

In addition, due to advances in consumer technology, particularly smartphones, smart watches, and fitness trackers, Intelesens believes that the market for medical-grade wearables will soon take off as consumers become more familiar with the technology. The USP offered by Intelesens is medical-grade monitoring, which is a lot more accurate and of higher quality than current consumer products.

Commercialization and follow-up

One of the key difficulties of scaling up production of the devices was retaining the high level of robustness. This is because it is important to obtain repeatability of tolerance, and the plastics and electronics that make up the product need to go through a number of control mechanisms in order to maintain a high level of quality. At the moment, this manufacturing issue is one of the biggest problems that the company faces, with the production of some good batches and some bad batches.

GE Healthcare was helping Intelesens with this problem, but GE has now moved away from monitoring and is focusing instead on medical imaging. Through their partnership with Intelesens, GE Healthcare would have been able to give the SME assistance with the scale-up stage by providing agile project management skills, regulatory advice, product control, marketing, engaging with the manufacturers (Flex Ltd) and further testing through clinical trials.

The SME has a new partner, Ultraling, in order to help them with the manufacturing problems and take the product to market.

Intelesens' plan is to sell the product world-wide and penetrate the emerging market of medical-grade wearables. Intelesens recognizes that this will have to be done in partnership with a larger firm that is able to provide the skills and resources necessary to increase production and roll out the product. They recently established a partnership with Ultraling in order to take on the roles that GE Healthcare fulfilled previously.

There are three products in the pipeline which are all being developed internally and have emerged as a result of their existing monitoring product. At this stage, the IP needs to be protected, so Intelesens has not engaged with any partners or external parties to discuss further collaboration.

BUSINESS IMPACT

The project resulted in a proof of concept, a working prototype, and first stages of production. It has also generated IP surrounding the software algorithms used by the devices which form part of the USP.

Intelesens has learnt to be more agile in terms of their capacity to incorporate new technology that is continuously emerging in the industry. The change in technology also means users now have a different level of expectation from consumer goods, and therefore Intelesens has had to engage with users closely in order to improve the user experience of their product.

The company has around £1 million in sales each year, all of which originating from its innovation.

LESSONS LEARNED

Intelesens uses open innovation in two ways: first by engaging with users and experts in the design process and second by engaging with large firms for the roll-out and commercialization. This case is interesting because GE Healthcare, their large partner, left the sector to focus on medical imaging, meaning that Intelesens has had to seek a new partner (Ultraling) that will take on the roles carried out previously by GE Healthcare.

Main lessons learned:

1. Partnering with a large company can also be a high risk for the SME, as a change in strategy by the large company may have an adverse effect on the SME. In this case, GE changed its strategy with regard to the sector it was targeting, which led them to discontinue their partnership with Intelesens. This meant that the SME had to find another large partner (Ultraling) that will assist them in rolling out the innovation.
2. The large partner carried out a wide range of roles besides marketing, which included agile project management, regulatory advice, product control, engaging with the manufacturers (Flex Ltd) and further testing through clinical trials. After GE Healthcare discontinued the partnership, the SME found another large firm (Ultraling) to take over these roles.