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Expert interview

Innovation management in the life sciences – Inova DE provides insights

Personalized medicine, medical technology, digital health and artificial intelligence are revolutionizing diagnostics and product development. Analyses are becoming faster and more precise, and data volumes can now be networked and used effectively. The goal of improving people's quality of life is within reach, and this will also strengthen Germany's future viability. However, not every good idea can be turned into a marketable commodity. How can this be changed?

Alongside demographic change, medical innovations such as special cancer and coronary disease therapies, are becoming increasingly important. "Targeted investment in R & D and commercialization are prerequisites for new products to be able to enter the market and make life sciences companies internationally competitive," said Vitor Vieira, managing director of Inova DE, an innovation management and software development services company from Heidelberg. Very few people understand the challenges as well as he does.

Dr. Vitor Vieira wearing the CAST T-shirt during a presentation event for the prototype. The T-shirt prototype is currently being tested on volunteers for data quality and reliability.
© Dr. Vitor Vieira

The Heidelberg-based company, founded in 2013, supports hospitals and small- and medium-sized companies in industry and science to turn ideas into finished products. The goal is to analyze and evaluate customers' innovative ideas and clearly define their potential. "As we develop our products ourselves, we know how it works in practice and where difficulties can arise," says Vieira.

The electrical engineer, who completed his doctorate in medical robot development at Heidelberg University Hospital, knows that the life sciences industry has high growth potential. However, this depends on realistic assessment and support to ensure that the hype does not just end up being hope. "It makes sense to involve business consulting firms and other partners, including those in the IT sector." Inova DE therefore devises financing plans based on an analysis of its clients' ideas, adapting them to project size and partners. Inova DE also deals with grant applications, supports development work and sets up contacts.

What kind of features does a product need to be a successful innovation?

Even though the number of new developments has increased in recent years, return on investment is nevertheless declining. A significant reason for this is the high speed of innovations. Companies have less and less time to recoup their research expenditures. "The goal is to develop more effective products. It's not just about those with high commercialization potential, but also about new approaches that target niche markets, such as therapies for rare diseases or new preventive measures," said Vieira.

An idea that has a lot of potential is therefore crucial for a groundbreaking innovation. "Progress must pay off and there needs to be an intensive exchange of information with experts, i.e. doctors, as we are speaking about the healthcare sector. The problem that the product is able to solve and what makes it better than rival products has to be clearly communicated." Inova DE knows the market and the competition, which, as Vieira describes using vivid imagery, must always sail forth on the open seas.

Many stakeholders are involved in the life sciences industry. Every target group, whether it is patients, interest groups from science, institutions or public administration, needs individual messages. For example, improved efficacy can make an innovation more user-friendly for the patient and more cost-effective for the health insurance company. In addition, an innovation in the life sciences also has the potential to solve the problems of other industries and can be interesting from the economic point of view. Thus, endoscopy and microscopy techniques can also be used in the fields of aerospace, energy and automotive engineering.

"In most cases, you cannot look at a technology in isolation. Rather, it involves the interlocking of medical product, devices, software and hardware. "Vieira can draw on more than 20 years' experience of working with experienced scientists, engineers and programmers from the partner company INOVA+ with branches in Porto, Lisbon, Brussels and Warsaw.

Promotion measures as a springboard

The telemedicine project CAST, which was developed by Inova DE, is a good example of launching a project. CAST improves the interaction between cardiac patients and cardiologists. The consortium consisting of economic and academic institutions from Germany and Portugal has developed a so-called wearable, a special T-shirt with a continuous real-time monitoring feature that records and analyzes patient's heart signals postoperatively at home. Irregularities are detected in good time and forwarded to the central server so that appropriate measures can be taken by cardiologists.

Heart disease is still one of the leading causes of death in the world. After heart surgery, 30% of patients return to hospital within one to two weeks, suffering from pain symptoms. 18% of these patients are diagnosed with postoperative atrial fibrillation, which comes with a significant risk of stroke and heart attack*. Laboratory testing of the T-shirt and electronics has now been completed, and Inova DE is about to launch a multi-center study with people from different European countries with different lifestyles. The data will be collected over a period of several weeks. Two groups of patients will be monitored, one group will undergo traditional treatment without telemedicine support, and the second group will involve patients wearing CAST shirts and undergoing remote monitoring for one month after operation. The aim of the study is to provide conclusive evidence to show that this digital tool improves patients' quality of life and reduces postoperative mortality.

The current Inova DE team with some of the research and development products, such as wearables for remotely monitoring cardiac patients and 3D models of organs that enable students and doctors to learn surgical techniques.
© Dr. Vitor Vieira

During the development of CAST, Inova DE has benefited from the H2020 TRIANGLE testbench that enabled the company to validate certain aspects of GSM mobile communications. Parameters such as valid communication transfer, exclusion of data corruption and battery life were optimized in different scenarios. The T-shirt approach offers multiple measurement points for electrodes. Application errors by patients, such as those that can occur with smart watches due to the electrodes that have to be applied, can be excluded.

The project is supported by Eurostars, a funding programme of EUREKA and the European Commission for Research-performing SMEs, and by the BMBF (E!10291). There is enormous public interest, not least because of marketing events such as presentations at exhibitions and conferences. In addition to focusing on the monitoring of patients by cardiologists, the follow-up project will also work on developing a user-friendly interface for smartphones that enables the patient to become active himself, be it through exercise or nutrition. "Support measures are the first springboard for many innovations," says Vieira. "Baden-Württemberg provides a lot of support with funding programmes such as digital@bw and accelerator programmes." The scientist once again emphasizes the networking aspect: "Also in Industry 4.0 funded innovations improve the healthcare sector through better understanding of digitization and different solutions."

Cost and data security efficiency

CAST has been developed in order to assess risks. Serious consequences and hospital stays can be avoided and cost savings therefore made. Here too, personalized medicine is becoming increasingly important. "The mentality of legislators and health insurance companies has to change. Individualized treatment increases the quality of life for patients as well as cost efficiency in the healthcare sector, as it avoids comprehensive and often ineffective therapies and medications. "Digitization, artificial intelligence and big data will play an increasingly important role, a wealth of data that needs to be made accessible efficiently is required in order to develop tailor-made therapies." Data privacy is important. However, I would like to see a European-wide, transparent approach," says Vieira, adding that "a non-targeted restriction should give way to a scientific mindset, especially with regard to the clear goal, such as patient well-being. It's about creating a positive environment. Since political decision-makers cannot fully understand the scientific background, an intensive exchange with experts who have extensive practical knowledge is extremely important for our future."

Reference

* Postoperative atrial fibrillation after coronary artery bypass grafting surgery. AF Ferreira (Porto,PT), FA Saraiva (Porto,PT), RJ Cerqueira (Porto,PT), R Moreira (Porto,PT), MJ Amorim (Porto,PT), P Pinho (Porto,PT), AP Lourenco (Porto,PT), AL Moreira (Porto,PT) - ESC Congress 2018, P1243.

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