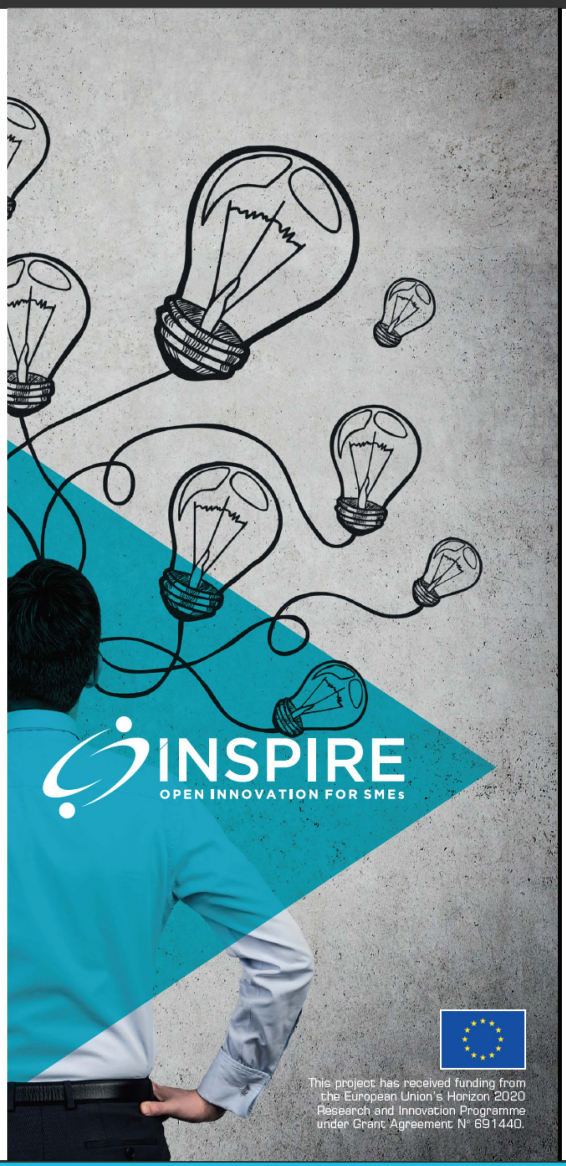

CEVOTEC

Germany, www.cevotec.com

A group of researchers working on a publicly-funded, joint industry- academia collaboration involving a new composite technology are allowed to license the invention from the multinational company and pursue its commercialization with a team of industrial partners

Executive Summary

This case concerns an advanced technological concept at Airbus Innovation Works. Airbus itself has no intention to further develop and commercialize it (not its core business). The case describes the different steps in the further development and commercialization of the technology via an external route to market. The case shows nicely that what can be labelled as an "out-licensing case" is in reality a complex and step-by-step process with a number of challenges in aligning and shifting of partners. The dynamics of the partnerships and inter-organizational networks are an integral part of the overall competitive dynamics in the case.

CASE N°: FG36

SECTOR: MECHANICAL OR INDUSTRIAL ENGINEERING

TECH INTENSITY: HIGH-TECH

LIFE CYCLE STAGE: START-UP

INNOVATION VECTORS: PRODUCT, PROCESS

01 PARTNERS: PSR, LARGE CORPORATION, LEAD CUSTOMERS OR USERS

KEYWORDS: Mechanical engineering, composites, licensing agreement, network dynamics, contracting, alignment of partners

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

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BACKGROUND

To understand the story of Cevotec, one has to start with the Fiber Patch Placement (FPP) technology which was invented by Airbus Innovation Works in 2008. Fiber patch placement (FPP) is the innovative preforming technology for the automated production of geometrically-complex 3D preforms and laminates with complex fiber architecture. Airbus decided that it was not the goal of the company to develop commercial applications based on that technology and decided to market the technology outside the company.

In 2011, the technology was advanced in a joint industry project that won support from the Federal Ministry of Education and Research. In a team with the Institute for Carbon Composites of TU Munich, the companies Airbus, Manz, Cenit, Otto Bock (medical company) and additional partners, the technology progressed from 2011 to 2014 to a working prototype that builds three-dimensional parts from fiber patches.

During that time the main founder of Cevotec, Felix Michl, worked for the Technical University of Munich and he managed the project from 2011 onwards. When the end of the project approached he realized that there was probably no partner who wanted to take the technology on and bring it to the market: he saw the opportunity to take the technology forward and founded Cevotec. The project was incubated with the help of a support programme called "EXIST Transfer Programme". (There are two main start-up funding strands offered by the German government. For the larger grant you need to be associated with a university, and Felix was at the time at the TU Munchen). Felix Michl, Neven Majic, Klaus Drechsler and Thorsten Groene met in 2012 and they decided to give it a try. In 2013 they hammered out the application for the large grant which was finally approved at the end of 2013. In 2014, they started the "Patchwork" project with this grant to commercialize the FPP technology.

They founded Cevotec in February 2015. It took another year until they gathered sufficient external funding from VCs (spring 2016). One of the reasons it took so long to get external funding was the need to align the business model with the interests of the old partners in the project. Therefore, during the incubation there were two major tasks - on the one hand, the technical side where they continued working on the concept and the prototype; on the other hand, the alignment of the business model with the partners.

In bringing the technology to market Cevotec needed an automation partner and a software company, since its partners in the project did not intend to invest in Cevotec. It therefore switched from Manz to Baumann Automation for the automation. For the software part, Cevotec realized that this was the unique enabler of their technology, so they decided to develop the software internally. They hired an experienced software developer, and in 2016 the software team was the largest development team in the company.

In March 2017 Cevotec concluded the technical development and presented the new FPP technology to the market at the JEC world trade show in Paris.

Cevotec intends to grow and further develop the technology. Today, the company is working with one kind of material, but the process is more universally applicable to other types of materials and fibers. This probably means that they will move away from the patented version by Airbus, and that they will develop their own technology and create their own IP. But at the same time, Cevotec recognizes that aerospace is the largest sector where composites are used on a large scale: it is probably also the sector which is most willing to pay for innovation in composite technology. For these reasons Cevotec will continue to have the closest links with this industry in future.

At the same time, the company is also exploring new areas of application, such as leisure and sport, medical devices and industrial products. Currently, the company is also looking into potential for the automotive industry. When they started Cevotec it seemed a little far-fetched that a small team at the university would be catering for the aerospace and automotive industry. But the commercial interest from these two industries came earlier and more forceful than they originally thought.

INNOVATION CHALLENGE & MARKET OPPORTUNITIES

The main trigger was that Airbus had this technology in-house, but it was not developed to a point that it could be commercialized. As Airbus had no intentions to develop it further in-house, grants were acquired to finance the technology up to the Poe stage.

It turned outthat none of the previous partners wanted to invest in this new venture. The automation company said that they had a different focus and some economic difficulties; the software company said yes but they wanted Cevotec to pay them for the additional work and that was not possible for the start-up.

At the beginning Cevotec was conceived more as an application company for the technology, but during this period it converted into a tech company, advancing the technology and finally offering the technology to market. Their main challenge was the alignment that is required between the partners, specifically when firms are hammering out the strategy and contracts.

Cevotec's management spent a lot of time in discussion over the articles of association to set up the company. "You have to think a lot when you set up partnerships and you have to develop clear ground rules. You have to think in advance of how you want the partnership to be and on what grounds it should be based. You need to do this up front. If you are already working with partners in some way or other, and you want to change something, it will be more difficult to get an agreement with them than if you do that up front. So from our experience it is best to do it early." For example, Cevotec already had some discussions with Baumann Automation about moving to other continents. In this case Cevotec would need a local supplier: how would jointly developed IP be governed in this case? Under what conditions could Cevotec use it?

Cevotec is riding the wave of the rapidly growing number of applications of composite materials. Shaping these materials into complex products that are required to have specific technical specifications is a demanding process. Cevotec is a forerunner in this area with a clear technological head start. The difficulty was to develop the technology from an idea into different commercial applications in a phased approach. This journey took almost nine years and it took several intermediary development phases (development at Airbus Innovation Works; grant funded project; establishment of a Corporate Venture-backed start-up. The challenge for the company now is to develop the applications in different industries by collaborating with several lead users.

OPEN INNOVATION TRAJECTORY

Concept development

This advanced technological concept saw the light of day at Airbus Innovation Works, although Airbus itself had no intention to further develop and commercialize it (not its core business). The technology had to be developed in different stages from a Poe to a prototype and later to commercial- ization through a start-up. The dynamics of the partnerships and inter-organizational networks are an integral part of the evolution of this case.

The Cevotec story is a classic example of how a radically new technology needs to be developed in different stages with a different focus till it reaches the market. The emphasis is always different and the partnerships change as the project develops: the technology was developed internally in Airbus Innovation Works, leading to a prototype which required the skills of other partners such as Manz (automation) and Cenit (software). As Airbus wanted to externalize the technology, grants had to be applied for from the government. The establishment of the company implied another shuffling of the cards: none of the previous partners wanted to invest in the venture and the team had to look for a new automation partner (Baumann) and integrated software development into the company because it was a crucial strategic differentiator.

IPR and competition strategy

Airbus Group owns the original patent. Once Cevotec was established and Airbus was no longer involved, the start-up required a license agreement to exploit the Airbus patent. That was not an easy process. The main negotiation hurdle was middle management at Airbus, and the deal almost failed because of that. However, the Cevotec management had connections up to senior vice-president level at Airbus, and this person was very supportive. He said: "Well it doesn't really matter if it's higher licensing revenue or if Airbus participates in any other way. It just has to be wrapped in a contract which represents a win-win for all of us". Cevotec now has a technology and licensing partnership with Airbus which allows the company to accept external funding and which protects the exit potential of Cevotec, a major concern for its investors.

Competitive advantage is clearly based on technological expertise. The company has currently a virtual monopoly over the technology (also protected by the licensing agreement with Airbus). It has few (if any) direct competitors. The search for new applications is however a tough journey, because Cevotec has to fight with existing solutions (non-composites) in these different application areas. Convincing B2B customers to switch to composites can be a long and hazardous process because of technological, safety and regulatory issues.

Commercialization and follow-up

The company is in the process of developing its first commercialization plans, so it is too early to talk about scaling up and rolling out the business. It is interesting to examine the choice of application areas and the shift in their choice in the light of market feedback. It is obvious that their market partners will become more important than their innovation partners in the long run and that Airbus' role will diminish as the company develops its own IP.

Another interesting aspect is the company's globalization plans and their impact on Cevotec's local partners, e.g. Baumann Automation.

Until 2014 Airbus was still involved in the project to develop this technology. They had an intrinsic interest in the project, as they were the principal actors involved in the application of the technology. But when Cevotec was established, Airbus gradually decreased their activity in this field. Once Cevotec received its external funding, the company moved to the Ludwig-Bolkow Innovation Campus, which is the former Airbus (and Eurocopter) headquarters. (Airbus opened a campus there for external tenants.) At that stage, Airbus granted the start-up their very early prototype of the technology. Until Baumann Automation developed the industrial systems, Cevotec worked with the Airbus prototype and the prototype from the Institute of Carbon Composites that Airbus also granted to Cevotec.

Today there exists a licensing partnership between Airbus and Cevotec, while Cevotec hopes to have Airbus as one of their first clients for their technology production systems. However, there is no guarantee that Airbus will become a customer. Currently, Cevotec already has an order from an Airbus subsidiary for a prototype project.

Other partners became involved in the "Patchwork" project. Partners are defined on a needs basis by the project (mainly the automation and software partners in addition to others), and by the restrictions *I* specifications set by the grant providers.

BUSINESS IMPACT

The OI collaboration has resulted in a number of learning outcomes, such as

- Skills in managing collaborative partnerships;
- Internal development of software skills – previously executed by a partner;
- Learning to shift to a next level in the development and commercialization stages – including changing partners whenever necessary;
- Internal research and competence building leading to new IP – gradually liberating itself from Airbus IP.
- Understanding in a more structured way how open innovation partnerships work;
- Managing relationships downstream with the market partners;
- Developing internal software skills;
- Developing new application areas;
- Serendipity/ flexibility in developing new market applications – adapting the application fields as the market feedback indicates unexpected benefits and challenges.

The company is still early-stage and has only recently started with commercializing its technology. Revenues are therefore limited. Securing different application areas with major B2B customers is now the strategic target. It is still too early to predict its financial performance, but Cevotec has all the qualifications to become a viable/ strong start-up.

LESSONS LEARNED

The value of this case is demonstrated in terms ofs, namely:

- Understanding the difficulties in commercializing a radical technology;
- The need to change partnerships as the R&D and commercialization process evolves over time;
- The need for a good licensing agreement;
- Learn about inside-out OI in a large company seen from the perspective of the start-up;
- Showing the complexity of creating a start-up with technology from an external source.

Main lessons learned:

1. Need for a good licensing agreement and gradually technological self-support over time.
2. Inside-out OI in a large company seen from the perspective of the start-up.
3. The complexity of creating a start-up with technology from an external source.
4. How to manage B2B customers in adopting a new technology.
5. Decision making about development partnermake-ally (e.g. software and automation)