

ALTECHNA R&D

Lithuania, www.wophotonics.com

An R&D-driven SME found an application for their laser technology with a Korean integrator company. Despite their innovation journey being cut short, the SME went on to license their technology to a MNC

Executive Summary

Workshop of Photonics (the R&D arm of Altechna) was looking for technology applications and business cases in a situation where, theoretically, many applications were possible. The crucial knowledge needed for commercialization was to access market knowledge – the future needs and challenges of potential clients. The company found a 'hot' application – thin tempered glass cutting when they were approached by a Korean integrator company. This partnership eventually failed, but Workshop of Photonics continued the project which led to a licensing / cooperation agreement with an MNC.

The case highlights the importance of knowledge which was gained over time and the ability to connect the pieces of knowledge (including 'exotic' knowledge which had no commercial use so far) and develop a solution for the market. It also shows that innovation opportunities are path-dependent, i.e. they emerge as a result of past experience.



CASE N°: EE38

SECTOR: PHOTONICS

TECH INTENSITY: HIGH-TECH

LIFE CYCLE STAGE: ESTABLISHED

INNOVATION VECTORS: PRODUCT

OI PARTNERS: PSR, OTHER SME

KEYWORDS: Laser machining, technology commercialization, company and PSR cooperation, intellectual property rights, customer needs, licensing out technology, partnership agreement with large company

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



Workshop of Photonics

BACKGROUND

Gintas, the owner of Workshop of Photonics, worked previously as a scientist in the field of laser photonics research in Lithuania and France. In 1996 he established a company, Altechna. The company's first business was rather successful trading in optical components for lasers and photonic applications. They connected technical knowledge and skills to provide their clients with market knowledge – mainly market research. But Gintas also had a vision for his company to become a research company. While the main income-generating activity was still trade in optical components, they had a number of R&D projects focusing on laser micromachining of various materials. Later, the company was split into two, the R&D part becoming Workshop of Photonics.

The interest in laser micromachining was stimulated by Lithuanian researchers and entrepreneurs Saulius and Egidijus. Their start-up company was working on a project for the Japanese company Nichia to develop advanced laser scribing technology. They asked Gintas to help to develop a demonstration unit of the laser micromachining workstation, which they did successfully. They also built a copy of the machine. As they had no place for the machine (it needed a cleanroom), they negotiated with Vilnius University to use their facilities free of charge. In exchange, they allowed the workstation to be used for teaching and research purposes. The company thereby acquired access to students and professors. Later, it proved to be a very important decision.

In future Gintas wants to strengthen WOP, but to do that they will have to develop a strategy which combines short-term activities ensuring earnings for survival, with long-term R&D based projects.

INNOVATION CHALLENGE & MARKET OPPORTUNITIES

The biggest challenge for Altechna R&D was to find the “right” application for their micromachining technology. Laser micromachining could be used for many applications in the watch industry and microelectronics, in designing equipment for biotech and biomedicine and many others. It was impossible for the small company to pursue many applications at the same time because of the need for expensive equipment and limited resources.

The ‘right application’ meant any of the applications that could exploit the uniqueness of their technology, deliver superior value to the client and could be taken up by the market fast enough. The challenge was in finding such an application.

WOP realized that there might be a market opportunity in thin tempered glass micro matching when they were approached by Asian companies asking them to make tests on glass. This was usual practice; they did it with sapphire, metal and plastic. Later, they were approached by a Korean company, an integrator working for a large Korean MNC which was ready to commit resources to the development of a workstation using WOP's technology. At that point they understood that there might be a real market need for the new thin glass cutting technology. WOP started collaborating with the integrator company learning from them about customer requirements as well as technology and economic issues that had to be addressed to push the technology into the market.

OPEN INNOVATION TRAJECTORY

Concept development

In general, it was clear that they could use their unique knowledge in micro matching using ultra-short laser pulses. However, they had still to find the right beam management techniques to suit customer requirements which involved a lot of experimenting. The business concept was also evident – becoming a supplier to the integrator company (and thus to the multinational corporation).

The development process, IPR and competition strategy

However, proving the technical concept which fitted the customer requirements took longer than expected. Mike, a partner from the Korean company, spent about a year in Vilnius working on the project. However, they could not find the right solution. The partner eventually decided to withdraw from the project, taking some technical know-how with them. The partner could easily have become a competitor taking the solution to the market on their own. But WOP also gained technical and market knowledge; at that time WOP was at the crossroads and was considering abandoning the project.

Finally, the owners of the company decided to try one more solution. The solution, a technical concept for laser beam formation, originated from their partnership with Vilnius University. As explained above, WOP established a micro-machining laboratory at Vilnius University. In this laboratory Gintas became acquainted with Paolo, a visiting professor, who had ideas about how to form the laser beam. WOP decided to try his approach of using Bessel light beams, and it worked. They worked on the technology together with the professor and his PhD student.

While developing their demonstration unit, WOP co-operated with their laser supplier company to achieve a high level of integration.

The question of IPR was first raised in 2012, when Paolo suggested patenting a method for high speed laser processing of transparent materials. At that time WOP was hesitant as they did not fully understand the value of the patent (as many SMEs, they had doubts about patentability and value). However, at a later stage they bought all the rights from Paolo and other co-owners.

WOP's competitive strategy relied on the technical advantages of their solution (achieved also partly through technology integration with their laser supplier), and the right timing of the offering. Having considered its resources and possible strategies, WOP chose not to mass-produce equipment. Instead they were looking for a partner who could buy a license and take care of manufacturing. At the same time, however, they were aware that they needed to make a number of workstations to demonstrate its advantages.

Commercialization and follow-up

WOP thought that commercializing their technology to the big MNCs directly would be a difficult task. First, it is difficult to know their needs. Second, to become a partner you have to knock on the right door at the MNC and at the right time. Third, the MNC would probably like to have a complete solution which fits their technological base. WOP thought that they had not enough resources to offer such a solution. The other, seemingly more realistic way, was to find a partner - an integrator company offering end-to-end solutions to their clients.

To commercialize their technology WOP's strategy was to identify partners for scaling up. At first they were thinking that they could license only their know-how, but later, when they became aware of the value of their invention that included also licensing their patent. Following this rationale, the Korean company was a suitable partner. When this partnership broke down WOP finished the

demonstration workstation on their own. However, they still had to find a way to take it to market.

The open innovation venture did not affect the organizational requirements of the company directly. On the other hand, if they wish to continue the same business model (commercializing technologies which are new to the market) they will have to resolve the issue of financing - technology innovations tend to have long investment cycles.

When the strategic partnership with the Korean company broke down, WOP decided to continue marketing the technology through participation in specialized fairs, such as Laser World of Photonics China in Shanghai and Laser World of Photonics in San Francisco, as well as other fairs and exhibitions. There they found some leads, e.g. a Chinese company to which they sold a workstation and non-exclusive license. In this context they also met representatives of the multinational corporation which later became a strategic partner to them.

The technology is now being adapted to other materials, e.g. sapphire.

BUSINESS IMPACT

WOP managed to develop a glass cutting workstation with superior features. They acquired knowledge of how to use Bessel beams for laser beam formation that could be re-used in other applications. They also got insights into other beam formation methods. They learned how to integrate lasers into their module to achieve better functionality, which is also re-usable. The company acquired exclusive rights to the key patent for their invention and filed patents for other inventions, including the method for glass cutting in curves.

WOP developed specific technical skills related to glass micromachining, such as cutting glass in curves and integrating the laser from the supplier into their module. They also learned how to detect a market opportunity through partnerships. The company developed experience in negotiations with MNCs. They also realized the importance of IP and how to spot patentable and valuable inventions.

This was a major project for WOP. First, it secured a continuous revenue stream from the license to the Chinese company. In addition to the lump sum payment for the IP, WOP also received R&D funding from the MNC. The figures are confidential.

LESSONS LEARNED

This case shows how “technology looks for an application”. The critical aspect is detecting the market need, which is difficult for a technology company. WOP did it through a partner. The ability to offer a solution at the right time is also important.

The case is also interesting because it shows that previous cooperation and projects create opportunities. In that sense, the company's opportunities were path-dependent – from R&D in laser micromachining to the request from Egidijus and Saulius, then to the cooperation with the university and the exchange professor Paolo and finally to the solution which met the requirements of the MNC. Access to the network, which included academia and supplier companies, was very important in this case.

Another important insight: when you are an R&D company and breakthrough innovations are rare, it is important to develop a business model that can accommodate long-term research and development cycles. WOP lives from larger projects and contract R&D. They are still looking to find the right mix and the company policy that works. There are also issues with motivation. It seems that finding staff who appreciate OI is an issue and that the roots may lie in the company's culture and organization.

Main lessons learned:

1. Integrators can play a crucial role in detecting new market opportunities.
2. The importance of IP strategy may be underestimated by a company, especially by a small electronics company.
3. Partnerships may break down so a plan B should be considered.
4. Cooperation negotiations may take a longer time than expected.
5. Previous knowledge can create opportunities.