

## The Benefits of Open Innovation in Low-Tech SMEs:

### The Quilts of Denmark Story

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#### THE KNOWLEDGE IN BRIEF

##### The fight against commoditisation

Open innovation and the external sourcing of technologies have received considerable attention from both practitioners and researchers in the last five years. Chesbrough and others define open innovation as "the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively." External technology sourcing is becoming more important for a number of reasons: shorter technology life cycles, emerging technologies with the potential to disrupt market leaders' positions, soaring costs and risks associated with science based technology, increasing globalisation of R&D activities in response to the greater dissemination of knowledge throughout the world, increased rivalry between companies in their product markets, and the growing role of seed and venture capital to finance excellent business ideas.

Despite the fact that open innovation has developed rapidly as a new management practice, most management insights and applications are based on individual cases of large, technology user firms. Open innovation in small and medium-sized companies (SMEs) has received much less attention, although the same insights can be readily applied to high-tech start-ups that are backed by venture capital. A few seminal publications (e.g. Van de Vrande et al., 2009) have shown that open innovation is also useful for SMEs in low-tech and medium tech industries. This chapter will look at ways in which SMEs in low-tech industries can benefit from open innovation. In particular, attention will be focused on one of the most serious threats they face: commoditisation. Many SMEs in these industries experience serious competitive problems as a consequence of the ongoing commoditisation of their products. As products or services become commodities, companies are increasingly forced to cut prices, resulting in diminishing margins and profitability. Low-tech SMEs in developed markets face a double disadvantage. Firstly, labour costs are too expensive to compete with competitors from low-

income countries. Secondly, they lack resources and the critical size to develop a sustainable, low-cost strategy based on labour-reducing investments and an accelerated internationalisation.

Unfortunately, many West European SMEs in low and medium-tech industries face this situation and only a small minority manages to successfully complete the transformation into a company with a bright future. Many of the problems faced by these companies – and many of the potential solutions as well – can be illustrated by an examination of the case study of Quilts of Denmark, a small Danish start-up in the bedding industry that succeeded in developing a lucrative, new market for ‘functional’ quilts based on open innovation.

The Quilts of Denmark case is a typical example of how small firms can develop a sustainable competitive advantage based on innovative, high-margin products. Open innovation played a crucial role in this respect, because the start-up company did not have the required knowledge internally to develop the new products envisaged by the founders. The case also illustrates how SMEs can use open innovation to obtain a competitive advantage which is hard to imitate by other competitors (both large and small). Open innovation in SMEs cannot be disconnected from the role of the founders, and it only becomes effective when the innovating company develops some specific internal capabilities.

## ABOUT THE AUTHOR



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### **Quilts of Denmark – open innovation in practice**

Quilts of Denmark (QOD) was founded by Søren Løgstrup and Erik Schmidt in 2000. Each had more than 20 years of experience in the bedding industry. QOD had its headquarters in Vamdrup, Denmark. The two founders were ambitious and intended to turn QOD into a leading company in the quilts and pillows business. They concentrated on functional, intelligent bedding products that would improve people's sleep.

In the 1990s the economic prospects for quilt and duvet manufacturers were steadily worsening. A quilt was a commodity: it was made from two pieces of fabric, with a quantity of down in between. Most European manufacturers at this time were small family-owned companies. Furthermore, the industry witnessed a major concentration in its distribution channels. Before 1990, there were around 50 to 60 retailers in the Danish market. However, once buying habits changed and price became the main focus, these retailers consolidated into larger groups with stronger purchasing power. By 2009, there were only five retailers left in Denmark. They dominated the market, with a share of some 90%. As a result of price competition between these large retailing groups, average profitability in the quilt manufacturing industry was rapidly decreasing and the sector was no longer an attractive prospect for new investment.

Løgstrup and Schmidt knew that they had come up with something dramatically new, in order to overcome this deteriorating market situation. Fortunately, they sensed that there was an opportunity in the increasing number of customers in developed economies who were attaching value to a better sleep and healthier sleeping conditions.

### **In search of a new business concept**

The two founders started with a vision to become “providers of healthy sleep”. With this central idea Løgstrup and Schmidt intended to produce and sell high-quality, functional bedding which would actively boost sleep quality. However, in 2000, this was just a pipedream, since the market for functional bedding did not yet exist and still had to be created. They first needed to acquire a better understanding of the factors which influence the quality of sleep. With this in mind, they reached out to people with expertise in a broad range of research areas that are related to sleeping and sleep comfort. They started to collaborate with research institutes, laboratories, hospitals and companies in different industries. They even established an informal advisory board, with experts on sleep who could advise them at regular intervals.

In one respect, Løgstrup and Schmidt were very lucky: several renowned sleep institutes were located in Danish hospitals. The sleep institute at the Glostrup Hospital of the University of Copenhagen was supportive, even passionate, about QOD's ambitions. These contacts introduced the founders to the science of sleep and the clinical practice of sleep medicine. They discovered in clinical reviews that sleep problems and disorders were a major problem in modern societies and they learned how the quality of sleep affected people's lives. More than 70 million Americans did not sleep well and this lack of sleep was costing American society billions of dollars each year. It was estimated that 56,000 car accidents in the United States happened because the driver fell asleep behind the wheel. According to scientists, this trend was an outcome of the growing impact of the internet, TV and other distractions at night. Løgstrup and Schmidt discovered that there were many different factors that influenced the quality of sleep, but temperature was one of the most important ones. Schmidt explained: "The body temperature of people is about 37°C, but this temperature is not stable all day long. When you get up and move during the day, your body temperature may rise by up to 1.5 degrees and it decreases again when you relax in front of the TV. However, your body temperature is still too high when you go to bed and try to sleep – at least to have a good quality of sleep."

In line with what they learned from the sleep specialists, the QOD founders tried to find a way to slowly lower people's body temperature without causing discomfort and then keep the temperature at that same level throughout the night. If they could do this, people would get into deep sleep more quickly, with a higher overall quality of sleep as a result. They started to look for different technologies that could control temperature in the manner they desired. They explored several possibilities but none resulted in a product with the expected specifications. Fortunately, however, salvation was at hand. One day, while browsing through a scientific magazine, Schmidt read about temperature phase change material technology (PCM) in an article about moon walks. According to the article, astronauts were exposed to extreme temperature fluctuations (up to 80°C) during space walks. Temperature phase change material was used in space suits to allow safe adjustment to such high temperature variations. To try out PCMs in quilts, Schmidt contacted NASA. PCM technology was originally developed for NASA in 1988 by Triangle Research and Development (TRDC). However, by 2000 the space agency was opening up access to specific space and military technologies, with the aim of promoting them for civil and commercial use. The PCM technology was one of them. Consequently, NASA brought the founders into contact with Outlast Technologies, which was an accredited licensee for this technology.

## The collaboration with Outlast

Outlast Technologies Inc., headquartered in Boulder, Colorado, was a pioneer in the research and development of phase change materials. The company was founded in 1990 as a privately held, venture-capital backed corporation. In 1991, Outlast Technologies acquired the exclusive patent rights for temperature-regulating technology, which was originally developed for NASA. Outlast intended to incorporate this innovative technology into commercial fibres and fabrics, in order to deliver superior comfort in high quality apparel, footwear, bedding, packaging and other applications. In 1998, Outlast introduced the first line of commercial gloves and footwear using PCM technology. By 2009, this technology was being employed in a wide range of other fabric and fibre-based products, where warmth and energy are important. Outlast co-developed and licensed its technology to interested partners. These partners could, in turn, sub-license the technology to other companies. Companies launching new products or services which directly resulted from space technology could also acquire the 'Certified Space Technology Product' quality label.

The material used by Outlast was hard and therefore useless for quilts and pillows. The two companies collaborated on the co-development of a softer material that could be used in QOD's bedding products. The technological challenges were considerable. Firstly, the engineers had to find out how to introduce the phase change material into quilts and pillows without reducing their flexible and fluffy characteristics. They devised a solution in which the phase change material was locked in very small microcapsules. These microcapsules were filled with a special type of wax that could absorb and release heat. A piece of fabric – suitable for the manufacture of quilts – could contain millions of these phase change microcapsules. These could be either applied to the exteriors of fabrics or infused into fibres during the manufacturing process. Due to the technical properties of the material, these protective polymer shells were extremely durable and therefore capable of withstanding textile production and cleaning.

The second technical challenge was to achieve the optimal temperature. It was discovered that the speed of cooling/heating and the final temperature could be determined by the mixture of microcapsules. Depending on its chemical composition, the wax in different capsules could melt at different temperatures. QOD interacted frequently with its medical contacts to obtain the mixture that delivered the optimal temperature and cooled off/heated up slowly enough to ensure a comfortable sleep. The company was experimenting with different mixtures, and samples were controlled and tested together with the medical experts. After a year and a half, they developed a first useful product with an 80% efficiency rate. It took a further year to optimise this process.

Based on this technology, QOD manufactured the world's first intelligent quilts and pillows, branded as TEMPRAKON. These bedding products provide temperature (TEMPRA) control (KON) during sleep. Unlike traditional quilts that simply trap heat, TEMPRAKON bedding absorb, store and release the heat emitted by the body. The Space Foundation duly recognised TEMPRAKON bedding products as a Certified Space Technology Product, and in September 2003 QOD introduced TEMPRAKON at a textile fair in Frankfurt. The products benefited from rapid market acceptance and the company grew with equal rapidity, increasing output from 40,000 quilts in 2003 to 210,000 units in 2007. Sales outside Europe was the fastest growing segment.

After this successful launch, Løgstrup and Schmidt were faced with new challenges. In particular, they had to accelerate production to meet the rapidly developing demand and also needed reliable methods to distribute TEMPRAKON products worldwide. QOD was still a small company, with relatively limited resources. They quickly realised that the production of TEMPRAKON could not grow fast enough to meet demand in the short term. To circumvent capacity problems and to generate the necessary cash to finance their rapid growth, QOD and Outlast Technologies agreed to sub-license the technology to other manufacturers. This was arranged by Outlast, following consultation with and approval by QOD. The sub-licenses were granted to producers in countries in which QOD was not present or was not interested. In this manner, QOD was also able to profit from the royalties each time Outlast sub-licensed the technology. This was, however, a two-edged sword. Even though these sub-licenses were limited in time and restricted to well-defined applications, QOD came to understand over time that too great a number of sub-licenses could also work counter-productively. Control over the quality of the product and its positioning in the market was limited. Even worse, prices dropped too rapidly as a result of the poor pricing strategy deployed by some of the licensees. Fortunately, the production of TEMPRAKON in QOD was growing rapidly and after a few years its capacity was large enough to sell its own TEMPRAKON products worldwide.

QOD also had to take some pricing decisions of its own. TEMPRAKON could not be sold at a high premium price. As Schmidt explained, there is a psychological price point in the quilts market. Sales rapidly drop, for instance, if the retailing price for a single quilt in Europe is more than € 300. QOD set decent margins for its TEMPRAKON products (which was possible because raw material prices were low at that time) but these margins were not sufficient to support the marketing efforts which such a radically new product needs. As a result, QOD's strategy was to make volume at a particular price point, rather than selling at high margins. By making volume, QOD reduced unit costs, thereby making the business more profitable. This also allowed them to sell to large customers and to expand rapidly to a global scale. To sustain this growth and to overcome its liquidity problems, Quilts of

Denmark intended to increase its margins through brand awareness. Awards were an instrumental part of this policy. In addition to receiving the seal of approval from the Space Foundation – QOD was the first European-owned concern to receive the Space Technology Certification – the company won several other innovation awards.

Even so, quilts and pillows remained low interest products and few consumers could name a quilt brand. As a result, the QOD management sought to increase brand awareness through the provision of better information to customers and better training for retailers and store managers. QOD developed its own methodology to train store people. Søren Løgstrup explained: “This is immensely important, because store managers really play a key role in customer decision-making. When you come into a store, you are at the mercy of the sales person. Our quilts are a little bit difficult to understand, so it can be a real problem when the sales persons in the stores don’t know how to explain the advantages of the quilts. If the sales person does not know the product well, he/she will be more inclined to avoid it and suggest another product to the customer, which is simpler to explain.” As an additional measure, QOD also worked together with stores to increase brand awareness in return for advertising budgets.

### **Continuous improvements and diversification**

Since quilts and pillows are usually bought by women, the QOD’s founders realised that they needed to create emotional value for their products. They needed to make them look good and feel good. To increase the visual impact, they decided to work together with leading promotional designers. They also found that the way the products were displayed in shops was not really appealing. Løgstrup commented: “I can tell you that our quilts are the best in the world, but when you walk into the shops, you don’t get a wild feeling about them, because you are faced with row after row of white quilts, all looking the same.” To differentiate their brand from the pack, QOD collaborated closely with their designers to modify the design of both the products and the packaging. This was a continuous improvement process, which sought to match the unique technological properties of TEMPRAKON with an equally strong visual image.

As a next step, QOD came up with the idea to develop the ‘ultimate dream bed’, called the Airborn. The Airborn was more than just a bed: it was a concept. As the name implies, it was airborne, breathable and heat adjustable – all in a single streamlined package. QOD developed a new TEMPRAKON mattress and the bed was designed (in close collaboration with the Artlinco design company) out of a vision to develop a product which could optimise people’s sleeping comfort. The bed had a unique configuration with centrally placed legs, coupled with a state-of-the-art motorised system to adjust the frame in various positions. The first prototype was introduced at the Copenhagen-

International Furniture Fair in 2005. The philosophy behind the Airborn concept was to expand the TEMPRAKON effect to other products, such as mattresses, mattress protectors, top mattresses, and the bed itself. For Schmidt, the move from quilts to mattresses was not a major step, but the leap from mattresses to a bed was quite a different matter. However, the opportunity of charging the higher margins which the bed market allows (being a much more specialised market), together with the continuing success of the TEMPRAKON shops (such as the one in Hong Kong), were enough to convince him to continue the diversification effort. The TEMPRAKON shops were a key part of the Airborn strategy. These shops were usually large outlets in major cities around the world, where customers could become acquainted with the whole TEMPRAKON experience, and could buy the full range of mattresses, beds, quilts, pillows and other products that had been produced with TEMPRAKON technology. The Airborn bed was not a major commercial success but it was an interesting stepping stone towards greater direct contact with the end consumer, and it certainly helped to strengthen the TEMPRAKON brand.

Schmidt was now also thinking how the internet could help to increase QOD's brand awareness, by increasing contact between the company and the customers. In 2010, they started a new TEMPRAKON website with features such as an image library, product galleries and extensive product information. The site was not, however, interactive and was not developed as an online sales channel.

### **The next challenge**

Løgstrup and Schmidt anticipated that TEMPRAKON would have its own limited life cycle. Consequently, there was a growing pressure to develop the next breakthrough product. During recent years the company has been working on a new generation of TEMPRAKON. The new TEMPRAKON is more efficient and technologically superior than the first generation. It represents a radical breakthrough, with a considerable increase in the product's ability to control body temperature. On top of this, it has the additional advantages of being able to regulate moisture levels, which helps to provide a more pleasant, healthy sleep. To date, professional and public reaction to the new material has been impressive and tests have been much better than expected. Quilts of Denmark now owns the sole rights worldwide to this material, called TEMPRAKON TRIPLE3. They also have a patent pending on its use. TEMPRAKON TRIPLE3 is considered to be by far the most effective material on the market and QOD is convinced that it can give the company a serious competitive edge vis-à-vis its competitors. The key question for the future, however, is how to position the new TEMPRAKON in relation to the original product.

## LESSONS LEARNED

### Lessons for other low-tech SMEs

The strategy of Quilts of Denmark – to introduce a radically new product – is not of course unique. Several small and medium-sized companies in low and medium-tech industries have implemented a similar strategy. The QOD example can be replaced by examples from the food industry, bicycle industry, heating systems industry, etc. The introduction of TEMPRAKON naturally entails a number of particularities, but all these innovating SMEs have much in common. Consequently, a number of generally applicable management lessons can be drawn from these examples. Moreover, it is also an interesting exercise to compare these lessons with the existing literature on open innovation practices in large companies.

### The role of vision and strategy

It is interesting to reconsider the reason why QOD was established in the first place. Two entrepreneurs wanted to become “providers of healthy sleep”. This may sound like an outburst of spontaneous creativity or the outcome of a brainstorming session, but this was certainly not the case. The two founders had more than 15 years of experience in the bedding industry and they had a broad range of relations both inside and outside that industry. In other words, their wish to become a provider of healthy sleep was the result of their experience, combined with a genuine knowledge of the trends that were developing not only inside their own industry but also in other industries that focus on the end consumer, such as the burgeoning wellness industry and the food industry. “Being provider of a healthy sleep” should therefore be considered as a proposal which the company makes to its potential customers. In this manner, it is offering these customers a new meaning to quilts. Quilts have always been considered as a product to keep people comfortably warm in bed. However, they trap heat, and the resulting temperature variations are usually too large to ensure healthy and comfortable sleep. The proposal that the company makes to potential buyers is not based on market research. It is not a user-centred approach, since the customers were not able to envisage in their mind’s eye that the properties of a functional quilt such as TEMPRAKON could actually be beneficial for their sleep. Only in rare cases are radical innovations the outcome of an analysis of customer needs (1).

Similarly, the proposal of the company is not based on new technologies. The textile industry is now entering a fascinating and challenging period, since most Western companies are being forced to seek breakthrough innovations in order to differentiate themselves from the competition from Eastern countries. Opportunities for radical innovations are emerging, thanks to new developments in chemical

treatments, while the use of microelectronics and nanotechnologies to make the intelligent fabrics is also opening up revolutionary possibilities. As a result, the founders of QOD could have adopted a technology push strategy or applied one of these new technologies to make an innovative quilt. However, the founders used neither a market-pull nor a technology-push approach for the development of the TEMPRAKON. And their judgment was sound. To have listened to customers would have led to incremental innovation, but would certainly not have revolutionised the industry. Likewise, cramming technological innovations into quilts would have been useless, if this was not supported by a reinterpretation of the role or meaning of a quilt.

### **The collaborative process**

The vision of QOD's founders about a radical new meaning for quilts was only a start. They had a great technical understanding of quilts and pillows and they knew everything about the market and its most active players. But they had no idea what it meant to have a comfortable and healthy night's sleep. Since they had no real experience in the field of sleep quality, they were forced to consult sleep experts - which they found in renowned sleep institutes, such as the Glostrup Hospital of the University of Copenhagen. These contacts introduced the founders into the science of sleep and the clinical practice of sleep medicine. The experts were supportive and interested in QOD's efforts to develop a quilt that would deliver healthier sleep. The founders were easily able to convince the experts to participate in the project: it was not a matter of money, but rather a matter of prestige and professional recognition. The experts were challenged to develop a discourse with an unexpected partner, who had the ambition to turn their insights into a new product that could revolutionise the quilt industry. Løgstrup and Schmidt became immersed in a broad discussion about healthy sleeping and they continued to communicate with these experts throughout the entire TEMPRAKON project. It is worth noting that QOD was not asking for ready-to-use solutions; instead, they started the discourse with the purpose of contributing to a larger research process. During this process it gradually became clear that temperature control was an important variable. This was the nexus where the science of sleep and quilt research could interact. QOD now had to look for technical solutions to create a quilt that could actively control temperature.

In the case of QOD, the search for technical solutions was somewhat chaotic. The time and energy-consuming trial-and-error phase, before finally coming into contact with Outlast, was the result of their lack of a prior network among technology solution providers. Other SMEs have already established a network of potential partners, based on prior innovation projects or as the outcome of existing informal contacts. Others find their way to the right research laboratories and technology providers through different types of innovation intermediaries. QOD, however, was a start-up and its

founders had no prior contacts with technical companies or R&D facilities that could help them to detect the solutions they needed for the functional quilt they wanted to develop. Once the Outlast technology was finally detected, the innovation process accelerated dramatically. The major hurdle was the initial lack of interest at Outlast, which at that time was focusing on the use of PCM technology for building materials. Fortunately, this attitude changed rapidly when its contact with QOD disclosed a broad range of possible applications in the textile industry. As a manufacturer of quilts and duvets, QOD was only interested in applying the new technology in its own branch of the industry. This meant that Outlast was free to license the technology to manufacturers in the textile industry's many other branches.

QOD played an active role in the innovation process. Although the insights about healthy sleep came from the sleep experts and the technological expertise came from Outlast, QOD still had to integrate this external knowledge into a useful product. This involved going back and forth between Outlast, as the technology solution provider, and the sleep experts, who tested the impact of the different samples on people's sleep. This bridging function between the different partners in the innovation network – whereby QOD pulled together the entire innovation network for the TEMPRAKON project – is one of the major requirements to make a radical innovation project successful.

In other words, for QOD – and for many other small companies in low tech industries – innovation was a consequence of collaboration. To initiate this collaboration, QOD's founders selected a broad range of partners. They first sought partners with whom they could develop a high-level discourse about how to achieve a healthy sleep. Next, they formed relationships with technology partners who could help them to develop the necessary technological solutions. In short, Løgstrup and Schmidt built up a network of partnerships based on their initial vision and they integrated the views of the different partners into the innovation process. There was no other realistic option. The company did not possess the required internal capabilities to develop a new, functional quilt that could actively improve sleep. Therefore, they had to rely on external partners.

These partnerships should not be confused with arm-length relationships with value chain partners or with innovation consultants. On the contrary, these innovation relationships are long-term relationships, which cross different industrial boundaries and in which the different partners share the risks on a basis of mutual trust. Much of the information that is shared in this network of partnerships is tacit and hard to codify. As a result, this privileged access to key innovation partners can generate a competitive advantage for the innovating SME which is hard for its competitors to imitate.

Although QOD had to rely extensively on its external partners to successfully develop the TEMPRAKON project, it also had to rely on two critical internal capabilities. Firstly, QOD had to understand how to leverage the insights of its external partners. The knowledge and expertise of the sleep experts, the physiotherapists, Outlast and Artlinco all needed to be integrated into a radically new product. The second capability of QOD was its in-depth technical knowledge of bedding and its proprietary knowledge about the quilt business. This capability explains why the external partners were interested to work with QOD. The company had hard-to-get knowledge about the product and the business, which other companies in the sector lacked. This was a key factor in bringing together the right partners in the innovation discourse.

Relying on different partners to develop and launch radically new products also implies that the innovating company needs to hold or develop a number of trump cards, in order to make the innovation network attractive for new partners. In the case of QOD, the use of the ‘Certified Space Technologies’ label was a guarantee that QOD would be able to strongly differentiate its TEMPRAKON line of products from potential imitators. This differentiation was further strengthened when the company received several innovation awards. Moreover, QOD was working in close collaboration with different standard-setting organisations, such as the Danish Asthma & Allergy Association for allergy problems, NOMITE for house dust mite allergy, Downafresh for hygiene requirements, etc. QOD was also a member of EDFA, the European Down & Feather Association, a much respected professional body that sets standards for product quality. Finally, Løgstrup and Schmidt also welcomed being invited as speakers at national and international conferences. These activities do not contribute directly to the bottom-line but they are key in developing a unique network of partners to advance further technological developments and increase brand name recognition.

### **Radical innovation with co-developed IP**

As previously mentioned, open innovation offers several benefits for SMEs in low-tech industries. Nevertheless, it also creates new challenges. One of these challenges is how to deal with the intellectual property (IP) issues arising from co-developed technologies.

Small firms like QOD seldom have the internal technical capabilities to develop radical innovations. Consequently, they have to search for external technology sources. Outlast, which co-developed the microcapsules based on its PCM technology, sells technological solutions and requires a licensing fee from companies that use its technology in their products. In this particular instance, Outlast licensed the technology to QOD on a worldwide scale for applications limited to quilts and pillows. Although the case study does not provide details about the IP contract between the two firms, it is reasonable to assume that the licensing fee paid by QOD was below market conditions, because of its contribution

during the innovation phase of TEMPRAKON. However, the licensing agreement also had a drawback for QOD, since it spurred the company to inflate its worldwide sales significantly within a few short years. This was a requirement negotiated by Outlast, because its royalty income was directly related to QOD's sales. This was a challenging requirement for a start-up company with limited financial and commercial resources. As a result, QOD agreed to a number of sub-licensing agreements with other manufacturers in countries where they had no sales agent or office, or in which they were not particularly interested. Later on, the QOD management realised that some of these early sub-licensing deals later on hampered QOD's own sales growth. The company tried to change this situation in 2010, by introducing a new generation of TEMPRAKON products.

Whilst QOD benefitted substantially from TEMPRAKON, it was by no means the only one. The development of the PCM technology was also highly beneficial for Outlast. The company not only profited from the commercial success of the new material, but its entry into the quilt and pillow market opened up a new application area for its technology. Moreover, the development of the microcapsules allowed Outlast to search for yet further applications in related industries, such as apparel, outdoor clothes, footwear and other bedding product (e.g. mattresses). With some minor incremental technological changes, the company was able to dramatically increase its royalty revenues.

It is clear that acquiring technology through open innovation is an interesting option for SMEs, but it also entails fairly complex IP agreements with technology partners. Both the technology provider and the SME should be able to benefit from this situation, providing the SME does not commit itself to rapid growth for which it does not have the necessary resources. In the case of QOD, the original agreement has hampered to some extent its own long-term sales. The good news is that a new generation of the technology now offers new opportunities for QOD to rethink its growth strategy and to better appropriate the benefits of its technological superiority. In other similar cases, it is not uncommon for technology partners to adapt their mutual IP and innovation agreements, if one of the partners is no longer benefiting from the deal because of changing circumstances (e.g. a substantial increase in raw material prices). This is only logical: open innovation can only work smoothly if all the strategic partners continue to benefit from their collaboration.

### **Follow-on innovation: restructuring the network**

During the 1990s there was a sharp contrast between the vision of Løgstrup and Schmidt and the other competitive drivers in the quilt industry. The founders of QOD formulated their vision as a result of years of observing trends in bedding. At the same time, however, there was a fierce consolidation in the retailing bedding products and retailers were competing on prices. This resulted in an accelerated commoditisation of quilts. Quilt manufacturers had not been innovating sufficiently during the

previous three decades. Under these circumstances, a company which manufactured quilts capable of providing a better night's sleep could easily differentiate itself from the pack. This gap between the need for a quality quilt that could improve people's sleep and the low quality products resulting from the price based competition between retailers was the reason why Løgstrup and Schmidt first established QOD. In reality, TEMPRAKON was a breakthrough technology offering added value for customers in an unprecedented way, but it still looked the same as all the other quilts in the shops. Despite the efforts of QOD to differentiate the product and its packaging, it was a serious challenge for retail staff to sell a product with a complex function, even after they had received sales training from QOD. Since retailers are very powerful actors in the value chain, there was a strong likelihood that they would challenge QOD to lower prices and sell on volume instead of value.

For this reason, QOD started to experiment with new ways to reach the end customer. The Airborn initiative, in combination with the opening of TEMPRAKON shops that directly demonstrated the benefits of PCM technology to potential consumers, was one approach used by QOD to increase awareness of the TEMPRAKON brand. E-commerce is another option which allows a company to gain direct access to customers. However, QOD is not yet experimenting with e-commerce, even though its new website was launched in the spring of 2010. According to Verganti (2009), companies like QOD should actively support a radical new product through proactive investments aimed at facilitating the understanding, assimilation, and adoption of the new meaning of that product, in comparison with its more ordinary competing products. A company that is seeking to change the meaning of a product should not only try to reach its consumers (just like any other company), but can obtain an even greater impact by reaching out to its community of prominent (innovation) partners and immersing them in a discourse about the changing nature of the concept of that product. This can be achieved in several different and often complementary ways. Many SMEs rely for this purpose on the publishing of books targeted at the cultural or scientific elite; others prefer exhibitions, cultural events, concept products shown at fairs, professional articles, dedicated websites, showrooms, test facilities demonstrating the value of the product, etc. When the innovating company communicates its breakthrough idea to the community of scientists in relevant disciplines, it has a better chance to reach a broader group of customers in a more convincing way.

## CONCLUDING REMARKS

### “Successful breakthrough innovation is never a one-shot game”

Since 2008, QOD has been developing a second generation of TEMPRAKON technology. New TEMPRAKON can be considered as a new breakthrough technology, which is more efficient and technologically sophisticated than its first generation equivalent. Moreover, the new material is hydrophilic, which gives this new TEMPRAKON, with its TRIPLE3 function, a real added value. As a result, the new technology could provide a unique opportunity for QOD to steal a march on its competitors. One of the major challenges is to ensure that the new TEMPRAKON is positioned correctly in the market in relation to the original TEMPRAKON material, which was launched in 2003. There are essentially two strategic options, each of which could strengthen the company’s market position. Firstly, QOD could re-launch the new generation TEMPRAKON within the wider pre-existing range of TEMPRAKON products. This strategy would allow QOD to re-negotiate sub-licenses and price settings with partners in several countries and the company could push previous licensees out of the market in countries where it now wants to sell its products directly to the retailers. Secondly, QOD could choose to keep on the old generation of TEMPRAKON quilts and add on a second layer of premium products, based on the new technology. This option boils down to the introduction of a second product brand, independent of the existing TEMPRAKON brand and focused on a higher segment of the market. Adding a premium segment sounds interesting, but price sensitiveness can also limit the benefits of this strategy.

With the introduction of the second generation of TEMPRAKON technology (scheduled to be launched in September 2010), QOD has shown that a company can further strengthen its market position through the cumulative effects of its efforts to improve its technology, build up relational assets and strengthen brand awareness. These are lessons that many SMEs would be wise to learn.

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## FURTHER READING

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## ENDNOTES

- (1) Lead users are an exception, since they explore new meanings to products and services. To turn the ideas of lead users into radical innovations, companies have to team up with them in long term relationships. See Leifer et al., 2001.