

QUILTS OF DENMARK

Denmark, www.qod.dk

Two entrepreneurs went in search of a high-tech solution to apply in a low-tech industry and through careful collaborations and intelligent IPR arrangements built a successful business selling duvets and pillows with unique added value

Executive Summary

This is the case of a new company in the quilts and duvet market which began life in 2000 in circumstances which posed seriously weak economic prospects for the industry. The value proposition of the new company was 'Healthy sleep for a better tomorrow'. The company used sleeping experts and research organizations to study the main issue with sleep, namely keeping a stable temperature throughout the sleep cycle. It then went on to license new technology and develop a number of partnerships to bring its products to the market.



CASE N°: SC02

SECTOR: MANUFACTURE OF BEDDING

TECH INTENSITY: HIGH-TECH

LIFE CYCLE STAGE: ESTABLISHED

INNOVATION VECTORS: PRODUCT, PROCESS

OI PARTNERS: PSR, OTHER SME, INDIVIDUAL EXPERTS

KEYWORDS: Quilts and duvet products, license in new technology, Phase Change Material (PCM), disruptive offering, license out manufacturing technology, partnership agreement with large retailers

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BACKGROUND

Soren and Hans had previous work experience in the bedding industry and both had entrepreneurial aspirations. Hans had actually established a bedding company in Singapore a few years earlier but when he met Soren, they realized that there would be great potential if Hans' talent for concept development and product innovation was combined with Soren's substantial experience in marketing and sales. As a result, Quilts of Denmark was founded in 2000.

INNOVATION CHALLENGE & MARKET OPPORTUNITIES

In the 1990s the economic prospects for manufacturing quilts and duvets had substantially weakened. Price became the main competitive focus and as a result retailers were squeezing profit out of the small quilt manufacturers. The profitability of the industry decreased rapidly and was no longer attractive to investors.

Soren and Hans agreed that there was a space for a new company in the quilts and duvet market to promote products supporting 'healthy sleep'. They called their company Quilts of Denmark and its main value proposition was 'Healthy sleep for a better tomorrow'.

The founders realized that nothing like the products they were envisaging already existed in the market. However, to make their vision possible, i.e. to produce and sell high-quality, functional bedding (quilts and pillows) that would actively boost the quality of their customers' sleep, they had to understand the factors that influence sleep quality. Temperature emerged as the most important factor which influences quality sleep, so the company aimed to come up with a range of bedding that keeps the body temperature stable throughout the night.

They started to collaborate with various organizations, including research institutes, laboratories, hospitals and companies in different industries. They sought actively information beyond the boundaries of their industry to understand the characteristics of "healthy sleep".

After the first round of interaction with sleep experts, the founders felt a bit lost as a wide range of factors and issues affect the quality of sleep.

They ultimately established an informal advisory board of sleep experts who could advise them on key issues while they signed a small contract with the sleep institute at the University of Copenhagen Glostrup Hospital.

OPEN INNOVATION TRAJECTORY

Concept development

The company had to find a way to gradually lower body temperature without causing discomfort and then maintain it at the same level throughout the night. The founders started to look for different technologies that could control temperature to produce the desired effects.

After exploring several technologies, Hans (by then Director of R&D in the company) learned about temperature Phase Change Material (PCM) technology in an article on space walks. According to the article in Science Illustrated magazine, astronauts were exposed to extreme temperature fluctuations (up to 80 degrees) during space walks. Temperature PCM is used in space suits to protect the astronauts from these temperature fluctuations.

PCM technology is comparable to ice in a drink; as it changes from solid to liquid, it absorbs heat and cools the drink, keeping it at the desired temperature for longer. PCM works in the same way, but is permanently enclosed and protected in a polymer shell, making it ideal for developing quilts and duvets that keep the temperature stable throughout the night.

Hans discovered that the PCM had been developed originally by NASA in 1988 by Triangle Research and Development (TRDC). The first contact with NASA was encouraging: NASA connected the company with Outlast Technologies, another SME which had a licence to sell the technology. In 1991 Outlast Technologies had acquired the exclusive patent rights for the temperature-regulating technology.

At the time of the company's request, NASA was sharing information about specific space and military technologies in order to promote potential civil and commercial uses. Outlast were mainly interested in insulation for residential buildings, so they were not competing in any shape or form with QoD.

The development process, IPR and competition strategy

As Outlast began to realize the commercial value of this new application in the bedding industry the partnership grew stronger. Both QoD and Outlast stepped up their collaboration, initiating joint development projects to advance know-how in the textile applications of the technology. In total QoD and Outlast spent almost two-and-a-half years on the development process.

As Outlast's main business was insulation for residential buildings the material used by Outlast was too hard for quilts and pillows; the challenge was to transform this hard material into a soft version, a task with considerable technical challenges.

First, the engineers had to discover how to introduce the PCM into bedding without reducing the quilt's flexibility and fluffiness. They worked out a solution in which the PCM was encased in very small microcapsules, the "thermocules". These thermocules were filled with special wax that could absorb and release heat. The material changed from solid to liquid and back again as the microcapsules absorbed excess body heat, stored it, and then released it again when the person's body temperature lowered by a few degrees.

The second technical challenge lay in obtaining the correct temperature. The rate of cooling or heating and the final temperature could be obtained through the mixture of microcapsules. QoD used knowledge gained from its medical contacts to find the mixture that delivered the optimal temperature - by cooling down and heating up slowly - to ensure a comfortable night's sleep.

Outlast and QoD had a broad agreement on using the co-developed technology. The agreement stipulated that QoD could license the PCM technology for quilt and pillow applications on a worldwide scale. Furthermore, their agreement granted QoD the sole intellectual property rights for their most important markets (Scandinavia) to sell quilts and pillows as well as in countries that were specified in the agreement.

In other markets, Outlast could sub-license the technology to other quilt manufacturers after consulting and reaching an agreement with QoD. Finally, QoD had the right to protect the technologies that they developed in applying the PCM technology to products in their business. QoD successfully applied for some patents related to using the technology in quilts and pillows.

In addition to forging a broad-ranging agreement, both founders emphasized that the sources of their collaboration and commercial success

stemmed from the trust they developed in their relationship over time. When problems popped up, both management teams always looked for a solution. They realized that the problem of one firm also affected the activities and financial health of the other.

QoD used this technology to manufacture the world's first 'intelligent' quilt, branded as Temprakon. The new product was introduced in September 2003 at a textile fair in Frankfurt. According to Hans everyone was amazed by the product, and Temprakon benefited from rapid market acceptance. In 2009, QoD offered a full range of products with four temperature types and various fillings and shells all based on clients' personal preferences.

It is clear that QoD adopted a disruptive strategy by choosing to compete on a new dimension of performance of quilts and duvets, i.e. maintaining body temperature during sleep. Price was no longer the decisive factor for their products competing in the market.

The Space Foundation recognized Temprakon bedding products as a Certified Space Technology, thereby guaranteeing that QoD would be able to differentiate its Temprakon line of products from potential imitators.

Commercialization and follow-up

After the successful launch of Temprakon, QoD faced a new challenge. They had to accelerate production to meet rapidly developing demand and to distribute Temprakon products worldwide.

To circumvent capacity problems and generate some cash for the rapidly growing start-up, the technology was licensed out to other bedding manufacturers, particularly in countries in which QoD had no presence or remained uninterested. As a result, production grew rapidly and in just several years, its capacity had grown enough to sell Temprakon products worldwide.

QoD also faced challenges related to pricing Temprakon products. To reach financial targets established in its contract with Outlast, QoD co-operated with some large retailers early on and established a solid working relationship.

However, the lack of familiarity (of sales people, clients, etc.) with the qualities of the new offerings presented an obstacle to scaling-up the sales. QoD worked to increase its margins through brand awareness. They also won several awards. Despite these successes, quilts and pillows did not command high interest among consumers. Most people did not even know the name of any

particular brand of quilt.

QoD's management launched an effort to increase brand awareness by informing customers and educating retailers and store managers. QoD developed a method to train some store sales staff and worked together with stores to increase brand awareness in return for advertising budgets.

Driven by the success of their quilts and pillows, QoD continued to experiment with new Temprakon products. To differentiate their offerings, QoD collaborated with designers on the appearance of the products and packaging. Next they developed the 'ultimate dream bed' – the so called Airborn - which management perceived as an important stepping stone to achieving direct contact with the end customer and strengthening the brand.

In 2010, QoD and Outlast developed a second-generation Temprakon. This new technology was technologically superior to the first generation and allowed QoD to terminate many of the sub-licensing agreements.

BUSINESS IMPACT

QoD succeeded in developing new quilts and new pillows based on the PCM technology that were able to maintain a stable body temperature throughout the night. Through this open collaborative process, QoD managed to master an advanced technology, the PCM technology, and its 'transformation' into a number of commercially exploited opportunities (e.g. a new product, new manufacturing process). Their newly acquired skills were evident in the follow-up developments where QoD developed a second-generation Temprakon technology which was technologically superior to the first generation.

The company learned how to identify new market opportunities through working with external organizations and experts. The company also developed experience in how to switch focus and type of open innovation partnerships as the innovation process moved from one stage to another: from consulting scientists and experts in order to capture the market opportunity to licensing in technology to develop the new concept, and from licensing out technology to enable scaling-up and manufacturing to setting up some joint activities with high-street retailers to support the sales process.

The new products allowed QoD to secure a strong position in the market by offering a clearly distinct product range competing on a new performance dimension.

LESSONS LEARNED

This case shows how high-tech solutions can be incorporated by a company into a low/medium technology sector with great success. In fact this 'fusion' of a high-tech solution with traditional products creates the conditions for a 'blue ocean' position where the company breaks away from the mainstream competition and creates a unique competitive position in the market.

The case also shows how the focus and type of open innovation partnership may have to change from one phase of the innovation process to another, involving different partners with different partnership strategies at each phase. Linkages with research organizations and scientists, licensing-in technology from another SME, licensing out manufacturing know-how to other companies and temporary alliances with high-street retailers can become necessary ingredients of a successful innovation.

Main lessons learned:

1. PSR (both organizations and individual experts) can play a critical role in capturing new market opportunities.
2. Licensing technology from a PSR can require intense commercial negotiations (especially in cases where the licence has been transferred to a private company).
3. The process of strategic collaborations may require negotiations and agreements at different levels, e.g. to license in technology for product development and to license out technology to help reach a critical mass in production.
4. Licence agreements may have specific geographical and market boundaries, e.g. licensing technology for bedding products in Europe only.
5. Licensing in technology can be a stepping stone to developing one's own technology and innovations at a later stage.
6. Developing trust and realizing that "the problem of one firm was also affecting the activities and financial health of the other" are critical enablers of OI.
7. A really innovative and radical solution may require additional investment in terms of educating both your sales force and customers.