

Launching the first mass product of a high-tech start-up company

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Abstract—This paper investigates the key success factors relevant for a sustainable commercialization of a new high-tech start-up product. A case study shall illustrate how a Swiss start-up managed to get accepted for the first time as a supplier of a large established company and what consequences this fact had on its development.

Keywords—Product Innovation, Technology Management, Entrepreneurship

I. INTRODUCTION

The initial customer set for a new high-tech product is made up primarily of innovators and early adopters [1]. The innovators are also known as technology enthusiasts, who appreciate the technology for its own sake. The early adopters are also called the visionaries, who have the insight to match an emerging technology to a strategic opportunity. Moreover, they have the temperament to translate that insight into a high-risk project and the charisma to get the rest of their organization to buy into that project. These early adopters of high-tech products are also called lead customers.

The transition from an early market dominated by early customers to a main stream market dominated by a large block of customers who are predominantly pragmatists in orientation and just want the benefits of new technology causes a gap in the development of a high-tech market, Fig. 1. Acquiring a lead customer in order to cross this gap is a die-or-do proposition for high-tech enterprises.

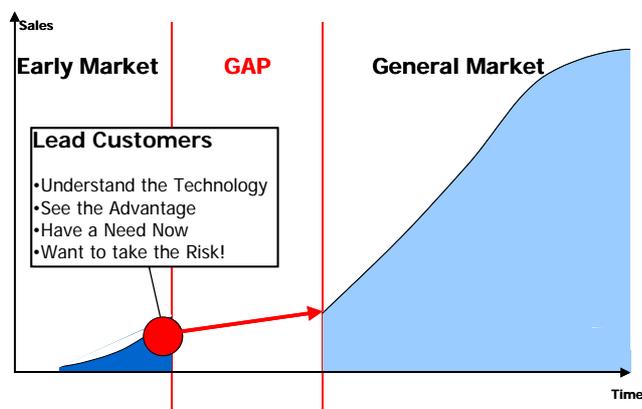


Fig. 1: Crossing the gap from a niche product to a mass product

For a high-tech start-up company it is even more difficult to acquire a lead customer: a start-up is small and unknown and collaborating with it is a risky business for a lead customer, which is usually a large company.

In this paper we study this problem from the marketing point of view.

II. METHODOLOGY

It is not much written about the commercialization of high-tech products in the particular case of a high-tech start-up company. Therefore, the adequate methodology to study the present problem is exploratory research. Exploratory research is conducted into a research problem when there are very few or no earlier studies to which we can refer. The aim of this type of study is to look for patterns, ideas or hypotheses, rather than testing or confirming a hypothesis (Hussey & Hussey, 1997) [2].

Typical techniques used in exploratory research include case studies. In the present work a case study shall illustrate the problem on a concrete example. The Swiss high-tech start-up company described is Sentron AG, founded in 1993, and the large company is the Swatch Group. The product of the start-up is an advanced magnetic sensor that is used in a Swatch Group's wristwatch for the compass function.

The choice of the high-tech start-up company was done following a recommendation of Ulrich (1981) [3], suggesting that a researcher in applied sciences may acquire understanding of practice only through continues personal involvement with practical problems. The first author was personally involved in this case.

The methods used to collect data in this study include interviews, documentary analysis and participant observation. The interviews were conducted with the founders and relevant employees of Sentron AG. The documentary analysis included company material (website, prospects, data sheets, internal documents). The observation was performed via the daily business in marketing and sales of the first author (interaction with customers).

III. THE CASE STUDY

It is described how Sentron AG [4] managed to get accepted for the first time as a supplier of a large

established company Asulab S.A. [5], the R&D laboratory of the Swatch Group [6].

One of the most prestigious trademarks of the Swatch Group is Tissot. Currently Tissot sales a watch named “T-Touch”, Fig. 2. This product was launched in 2000. The watch contains several sensor functions including thermometer, altimeter, meteo and compass. The compass function is based on a magnetic sensor chip supplied by Sentron AG.



Fig. 2: The watch “T-Touch” (reprinted from Tissot promotion material, 2003)

The essential issue of this case study is the very first **sale** of a start-up’s product on a new market. Therefore, this study is structured according to the 4P-elements of marketing.

A. Promotion - Communication

How have Asulab and Sentron met? Sentron has developed its first three-axis teslameter (an instrument for measuring magnetic fields) in 1997 in collaboration with the Swiss Federal Institute of Technology Lausanne (EPFL). The key element of this instrument was an unique 3-axial Hall magnetic sensor. The main potential users for this product were scientists and engineers. Accordingly, Sentron concentrated its promotion on this community and did this exclusively via scientific publications.

At about the same time Asulab was working on the development of a new product. Asulab’s engineers were still looking for the appropriate components for the new product. Being an R&D laboratory, Asulab collaborated with several universities and was in touch with scientific communities. So they learned about the new 3-axial magnetic sensor of Sentron. They got in touch with Sentron in order to discuss the possibility of applying this technology as a part of their new compass in the watch. Although Sentron did not make any promotion (no advertising, no sales calls), its activity (contacts with the scientific community) was just right to attract the attention of a potential lead customer for a mass application of its new technology.

B. Product – Customer Solution

The essential part of the compass used in the watch of the Swatch Group contains the following main components: a little cylindrical magnet magnetized as shown in Fig. 3. The magnet is fixed on the axis held between two bearings so that it can freely rotate. Under the influence of the earth magnetic field, the cylindrical magnet orients itself accordingly, much as the magnetic needle in a conventional compass does. The position of the magnet is then sensed using a two-axial Hall magnetic sensor, Fig. 4. A Hall magnetic sensor is not sensitive enough to determine directly the direction of the earth magnetic field. This is why the rotating magnet is used here to “amplify” the earth’s magnetic field (here in this case about a factor of 1000) [7].

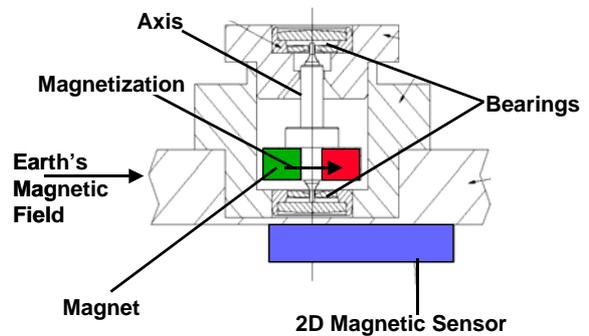


Fig. 3: The system inside the wristwatch “T-Touch” (reprinted from Germiquet et al, 1999)

In order to determine the orientation of the horizontal component of the magnetic field, one must measure its two components. This means: if the conventional Hall elements were used, one would need two of them as described in the early version of this solution [8].

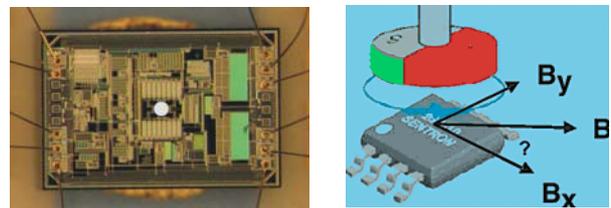


Fig. 4: Left: Photograph of the “naked” two-axis IMC-Hall sensor; right: packaged 2-axis IMC-Hall® ASIC (Reproduced with permission from Sentron)

By that time Sentron, a four-people start-up company, was using the so-called vertical Hall technology for their magnetic measurement instruments. The vertical Hall technology permitted an integration of two Hall devices

on the same chip. The decisive advantage of Sentron's technology was that it made possible for the first time to measure both components of the magnetic field with a single chip. Moreover, Sentron devised this sensor for low power, small size and high stability - the features important for the first intended application in the magnetic field measurement instruments. By chance all these features are obviously perfectly matching with the watch application of Asulab: two-axis, small size, low-power and high stability.

However, the existing Sentron's magnetic sensor chip was not applicable as is in the new product of Asulab: it needed redesign, mostly in order to get rid of the features that were not used in this application. The fact that Sentron already sold a few instruments based on this chip to some well-known scientific laboratories in the USA helped a lot to convince Asulab about the technology. So Asulab started collaboration with Sentron with the goal to adapt the chip for their use. The result was the Sentron two-axis Hall magnetic sensor 2D-VH-11, which in 1998 entered into the test series. After successful completion of the tests, the Swatch group launched in 2000 the final product: "T-Touch" of Tissot. This watch application was the very first large volume sales of Sentron's product 2D-VH-11. Whereas the first application of the two-axis Hall sensor in magnetic measurement instruments consumed about 100 of these chips per year, the watch application went from 50'000 (in 2000) to about 200'000 (in 2003) per year.

C. Place – Convenience

If Sentron and Asulab were not in the same small country and if they were not belonging to the same small community of R&D, chances to meet each other would be much smaller.

Adapting a high-tech product such as magnetic sensor chip to another application is a complex process, which needs a lot of interactions between the supplier (Sentron, Zug, Switzerland), the front-end customer (R&D Asulab S.A., Marin, Switzerland) and the final user (ETA S.A., Gränchen, Switzerland) [9]. Many discussions between engineers, commercialists and managers of these companies took place until the supplier-user-relationships were finally established. All these meetings were particularly easily organized thanks to the small physical distance of the three places.

D. Price – Customer Costs

Working with the small start-up company as Sentron was a very risky business for Asulab. Accordingly, at the beginning, Asulab was not ready to invest much money in the collaboration with Sentron. On the other hand, Sentron's costs were low (low overhead, no expensive equipment); moreover Sentron estimated that the know-how gained about a large scale production and the image

associated with such a prestigious and visible application as a compass in a Swiss watch was much more important than an immediate profit. So, they offered the first adaptation of the existing chip for only CHF 10'000 and later the production of the test series of chips for another CHF 40'000. This just covered Sentron's costs. But the low costs made easy the decision of Asulab to launch the project. The profit for Sentron came later with the deliveries of the production quantities to ETA S.A. and particularly through the catalytic effect that this project had in the development of many other business relationships.

E. Later Development

Short after finishing the adaptation of the sensor chip for the compass application for Asulab, Sentron identified another opportunity for an important application of the same chip: the contact-less potentiometer that was under development at Contelec AG, Biel [10], Switzerland. The essential facts that enabled a very fast acceptance of this technology at Contelec were: that Asulab had already accepted that technology; and that samples of the chip were already available at low cost. Although started later than Swatch Group, Contelec being a small company, was faster in launching the product. Their contact-less potentiometer based on 2D-VH-11 was on the market already in 1999.

Then Sentron started with a modest promotion campaign of this product. Several prospects grew interested but also very sceptical about a new revolutionary technology promoted by a start-up company. Their first questions were: "Is your product already in production?" and "Do you have reference customers?" The fact that Swatch was a customer impressed many of them. Eventually, an application for miniaturized motors at Minimotor S.A., Croglio, Switzerland [11], of angular position sensor at Invensys, Sarasota, Florida, USA, and a few others were developed.

The success of 2D-VH-11 was instrumental also in establishing contact with the major Japanese company Asahi Kasei. Asahi Kasei bought the license for Sentron's patents on the IMC structure and financed the joint development of the first two products based on the IMC technology. The development took less than two years, from October 2000 to June 2002.

The income of Sentron based on the sensor chip sales raised to about CHF 600'000 in 2002. Then the vertical Hall technology on which the 2D-VH-11 was based became obsolete and not any more available at Sentron's silicon foundry. Luckily enough, by that time Sentron finished the development of IMC technology. Using IMC technology Sentron developed a replacement for 2D-VH-11, the type 2D-HMC-10, which is now used in Tissot T-Touch. The fact that the brand name Sentron already existed in relation with the two-axis magnetic sensor 2D-VH-11 greatly facilitated the acceptance of the IMC technology on the market. Sentron's sales exceeded 2 Mio

CHF in 2003. IMC technology attracted a lot of interest of all large companies active in the field of angular position sensors. Sentron was asked both to sell licenses or to sell "itself". In February 2004, Sentron's sensor business and the label Sentron was acquired by Melexis N.V., a 120 Mio Euro IC company [12]. In the press release of Melexis we read: "Melexis N.V. further invests in sensor technology by acquiring Sentron AG." [13] At the same time, a spin-off of Sentron, the company SENIS was founded [14]. Senis has taken over the whole business of Sentron regarding magnetic measurement instruments, Fig. 5.



Fig. 5: SENIS magnetic measurement instrument (reprinted from Senis promotion material, 2004)

IV. DISCUSSION OF THE CASE STUDY

In order to "cross the gap" from a niche product to a mass product a start-up needs big reputation and relationship with an appropriate lead customer. From the case study above about Sentron's chip for the Tissot watch we can generalize the process of acquiring the lead customer for a mass product as follows.

A. Unique Solution

The basic condition for this process to start is a genuine interest of a potential customer. If this customer had a problem he would seek to solve the problem rather in collaboration with established companies. Only if his problem cannot be solved in a conventional way or in collaboration with established companies - and a start-up has a unique technology that is perceived by the prospect as a probable solution of his problem - then the prospect is likely to enter in collaboration with the start-up.

B. Good Marketing Mix

Once the above condition of the fundamental interest of the potential customer is fulfilled, the rest of the process could be viewed as a specific case of the sales process. Therefore, an appropriate marketing mix must underline this process [15]. Briefly, we may so summarize the marketing's 4Ps of the section above:

Promotion: The seller (start-up) and the buyer have to be present in the same milieu (in this case the R&D community of Switzerland) and emit the information about the needs (buyer) and a potential solution (seller). This issue was very much dependent on the location (physical resource of the start-up).

Product: The unique technology of the start-up must be easily applicable to yield the product satisfying the needs of the customer. This is not easy to recognize. Sentron had demonstrated before the performance of its new chip in a niche market of magnetic measurement instruments. By chance the features of the chip were perfectly matching with the watch application of Asulab: two-axis, small size, low-power and high stability.

Place: The whole process of the recognition of the potential and the needs, and the collaboration seller-buyer must be convenient. In this case it took place in the same small country between the people of the same R&D community.

Price: Collaboration with a start-up is a very risky business for the buyer. Therefore, the price that the buyer has to pay must be low enough at the beginning. As the risk decreases, the price should gradually increase in order to satisfy the interests of the start-up.

C. Gaining confidence

The main problem in the whole process is an objective risk for both parties. For the seller the questions arise: "Shall this technology really work in our case?", "Is it reliable in the long term?", "Is the start-up capable of organizing production?", "Shall the start-up survive?". For the start-up the questions are: "Shall the potential customer really decide to adapt our technology (perhaps he has an alternative?)?", "Can we afford the investments into production?", "Is this product generic enough, so that we can sell it also to others?".

During the process of the acquisition of the first (lead) customer for a new technology, both the seller and the buyer gradually reduce the importance attributed to such questions and gain confidence in the chosen solution and the chosen partner.

D. Acquisition of further customers

The process of the acquisition of a lead customer is particularly important for a start-up in the case of a generic product – a product that may be used in different applications and in different market segments. This was the case with Sentron's two-axis Hall magnetic sensor chip. Apart of the compass application in the watch, it can be used in magnetic contact-less angular position sensors and in rectilinear position sensors. Each potential customer for such application would perceive working with Sentron as a big risk – if there were no reference application in a Swiss watch. The following facts were absolutely essential for rapid gain of confidence of further potential customers of the technology: a reference application existed, which was easy to demonstrate and was associated with the image of Swiss precision. According to "Later development", Section E, the success story of Sentron started with the acquisition of the lead customer.

V. CONCLUSION

It is found in this work that the analyzed start-up needed an appropriate lead customer in order to cross the gap from a niche product to a mass product.

During the process of the acquisition of a lead customer it was particularly important that the new product was generic enough, so that it can be sold also to other prospects – a product that may be used in different applications and in different market segments.

Further, it is found that the classical mechanism of marketing, including the importance of the marketing-mix, also works in this particular case. But the relative importance of various marketing notions and processes is different for the start-up than for an established business. For example, the start-up has no chance unless its product, based on a "big idea" is strongly differentiated from anything else in the market place.

Generalized, these findings give the hypothesis that the same relationships exist in other similar high-tech start-up companies during the launching of their first mass products.

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REFERENCES

- [1] Moore, G. A., „Crossing the Chasm: Marketing and Selling High-Tech Products to Mainstream Customers“, Harper Collins Publishers, New York, 2002, pp. 30-41.
- [2] Hussey, J. & Hussey, R., "Business research: A practical guide for undergraduate and postgraduate students", Macmillan press LTD, London, 1997, p.10, and p. 66.
- [3] Ulrich, H., "Die Betriebswirtschaftslehre als anwendungsorientierte Sozialwissenschaft", in "Die Führung des Betriebes", hg. Geist und Köhler, Poeschel Verlag, Stuttgart, 1981, p. 21.
- [4] Sentron AG, Zug, Switzerland; www.sentron.ch, February 2004.
- [5] Asulab S.A., Switzerland, www.asulab.ch, February 2004.
- [6] Swatch Group, Switzerland, www.swatchgroup.ch, February 2004.
- [7] Noell, W. et al, "MEMS for watches“, 17th IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2004), Maastricht, NL, 25-29, Jan, 2004.
- [8] Germiquet, C. et al, "Alpinist-une montre altimètre-boussole présentant un nouveau concept d'utilisation“, Société Suisse de chronométrie, acte du 64ème congrès de chronométrie, Le Sentier, October 1999.
- [9] ETA S.A., Switzerland, www.eta.ch, February 2004.
- [10] Contelec AG, Switzerland, www.contelec.ch, February 2004.
- [11] Minimotor S.A., Switzerland, www.minimotor.ch, February 2004.
- [12] Melexis N.V., Belgium, www.melexis.com, February 2004
- [13] Melexis Financial News, February 3, 2004.
- [14] SENIS GmbH, Zug, Switzerland, www.senis.ch.
- [15] Kotler, Ph., "Marketing Management", Upper Saddle River NJ, Prentice Hall, 2000, p. 15.