

LYNCÉE TEC SA: SCALING UP A TECHNOLOGY VENTURE

Research Associate Jana Thiel prepared this case under the supervision of Professor Ralf W. Seifert as a basis for class discussion rather than to illustrate either effective or ineffective handling of a business situation.



Yves Emery, CEO of Lausanne-based Lyncée Tec, a provider of innovative holographic microscopy systems, listened to the voice message he had received while he was out at lunch. The venture capitalist (VC), to whom Emery had presented the Lyncée Tec investment opportunity last week, had called: He was interested in investing, provided that some additional amendments could be agreed upon. To learn about these new terms and then hopefully settle the deal, Emery had to call back by 17:00 at the latest that day--Tuesday, May 10, 2005--as the VC would be out of town for the rest of the week.

Emery leaned back, pondering how to respond. He knew from experience that the amendments to expect at this stage were most likely an increase in the VC's share, an entire revamp of the board and a definite exit after five years. It was not his first VC contact--and he had turned down other offers before.

At the end of the day it comes back to trust. Do we trust the investor to pursue the same goals as we are? We are looking for someone with whom we can build a house together, so to speak.

Since its inception, Lyncée Tec had been in the comfortable position of being able to finance its operations entirely from sales. Nevertheless, funds were still limited and this restricted the venture's operational freedom. Hence, Emery was looking for an added CHF 1.3 million to grow Lyncée Tec more aggressively to get a lead over the competition and seize the window of opportunity.

On the other hand, Emery was in the middle of promising negotiations with a long-term strategic investor, although nothing was fixed yet. Financing, however, was only one issue on Emery's jam-packed agenda. He would certainly appreciate having it taken off his shoulders, as it was somewhat of a gating issue. For example, the slow-moving bargaining with a potential distribution partner might speed up considerably if Lyncée Tec could boost its financial credibility.

Emery gazed at the phone, not sure how to respond to the VC's offer.

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Company Background

The technical foundation that led to Lyncée Tec's inception stretched back to 1948, when scientist Dennis Gabor invented holography.¹ Digitalization and the advance in computing technology and speed led to new industrial applications which benefited from this principle. In 1994 a project was launched at the Ecole Polytechnique Fédérale de Lausanne (EPFL) to investigate digital holography and its practical application, specifically in biotechnology. In 1998 the team was joined by researchers from the University of Lausanne (UNIL). Four years later the inventions were mature enough to contemplate creating a marketable product, and a new venture--Lyncée Tec SA²--was incorporated in May 2003.

The start-up aspired to develop, manufacture and market imaging systems based on "Digital Holographic Microscopy" (DHM). It was founded by a multidisciplinary team of engineers, physicists, physicians and biologists. Four of the five co-founders had fathered the base invention and co-authored the patents that protected the core of the business: intelligible processing of 3D holographic images from microscopes with nanometer resolution.

By May 2005, Lyncée Tec employed seven people working full time in production and R&D (partly paid by public grants). In addition, frequent collaboration with PhD students helped to further advance the technology base.

Throughout 2004, Lyncée Tec had operated on a breakeven basis--a staggering outcome achieved solely from income from customers. For 2005, sales were expected to be CHF 1 million, strengthening the previous results.

The Product

Lyncée Tec leveraged its DHM technology by offering not only a product but also lab services. The services included the production of movies of a sample's temporal evolution, defect characterization, and optical measurement consulting, which frequently led to subsequent orders of the product--the image processing device.

Lyncée Tec's product comprised two components (*refer to **Figure 1***):

1. A *holographic microscope*, which recorded the information from the sample as a hologram by measuring both the amplitude and phase of the light and thus providing more detailed and complete information than other microscopes.

¹ Holography is the recording and play back of three-dimensional images of an object which allows the viewer to move back and forth and up and down to see different perspectives as if the object were actually there. In 1971 Gabor was awarded the Nobel Prize for the invention.

² Initially Lyncée Tec was called New Holography but it was soon renamed to ensure uniqueness and branding opportunities. The name is derived from Lynceus, a figure of Greek mythology, who had preternaturally keen sight and could even see things that were underground.

The instrument consisted of a rigid frame, a translation table for the sample, a microscope objective, various lenses and mirrors fixed to the frame, a laser type source and a digital camera.

2. The *DHM software*, which enabled the “image reconstruction,” i.e. the digital processing of the holograms in real time and representation of a 3D quantitative image of the observed object on a PC screen.

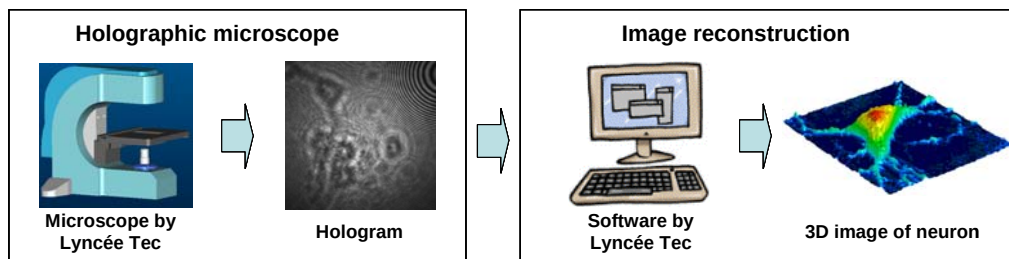


Figure 1: DHM imaging system, comprising a microscope to acquire holograms, and software to digitally process the hologram and build up a 3D image of the observed object.

The software, i.e. the numerical aspect, played a strategic role. Whereas competitive techniques applied digital treatment of the image independently of the instrument and only at the end of the process, DHM integrated the digitalization at the heart of the system. The interlocking of software and hardware and the use of advanced numerical methods permitted both unrivaled *imaging performance* (resolution and speed) and *ease of use* (automation and robustness). At the same time, the *production cost* of the instrument was kept low. In general, Lyncée Tec’s 3D high resolution microscopy was perceived to be unique because it simultaneously allowed:

- ***Real time imaging***, enabling people to analyze samples very quickly or to study object movements, vibrations or deformations of very small amplitude
- ***Strictly non-invasive observation***, i.e. the measurements did not disturb or even destroy the sample
- ***Easy to perform measurement***, which did not require any controlled environment or sample preparation.

Besides constituting a unique selling proposition, this unprecedented performance allowed Lyncée Tec to pioneer new markets by fulfilling requirements that existing systems with nanometer resolution could not meet.³

The base technology could also find applications in fields other than microscopy. Although Lyncée Tec focused explicitly on commercializing the holographic microscopy, it did not rule out developing other products or services at some stage (e.g. nano-barcode readers). In any case, the key to success was the software, i.e. the numerical approach, which was protected by three patents in the US, Europe

³ For additional information on the innovativeness and specific performance data of the product, refer to Lyncée Tec’s website <http://www.lynceetec.com>

and Japan. Ownership of two of these was shared with EPFL, which had granted Lyncée Tec an exclusive worldwide license for the development and commercialization of measuring and imaging devices. A third patent, drawn up by intellectual property (IP) professionals, had been filed in the sole name of Lyncée Tec SA in 2005.

Both the outstanding performance and airtight protection of Lyncée Tec's technology base were key to entering and competing in the microscopy market.

Competing Firms and Technologies

The microscopy market in 2005 included six major imaging techniques apart from DHM: atomic force microscopy (AFM), scanning electron microscopy (SEM), optical microscopy (OM), interferometers, contact probe systems (CPS) and specific measurement sensors (SMS).

All were mature and well proven but nevertheless inferior to Lyncée Tec's DHM, either because of their invasiveness (AFM, SEM and CPS), which meant they could not be applied in life sciences, or because of their high cost (high-end OM), or because they lacked speed, which hampered industrial application (SMS, interferometers). DHM took a clear lead when compared in terms of *speed* and *measurement range* (refer to **Figure 2**); it even had the potential to replace existing systems, specifically interferometers. (Refer to **Exhibit 1** for additional information on these technologies and how they compare to DHM.)

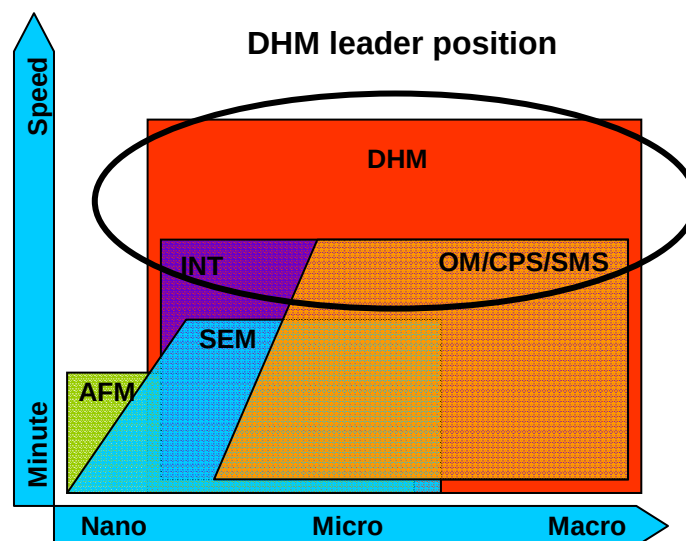


Figure 2: Lyncée Tec's Competitive Position (DHM)

Although Lyncée Tec was obviously a serious competitor on the technological level, a lingering threat was that quite a few providers of current imaging systems were large and well-known companies (refer to **Exhibit 1**), with the corresponding resources. The start-up was not able to match their track record, or their marketing, sales and service infrastructures. Lyncée Tec's management team still had some way to go to gain market recognition for their venture and earn customers' trust.

Management Resources and Networking

Management Team and Board

Lyncée Tec was managed by CEO Yves Emery and CTO Etienne Cuche, both co-founders of the venture. Emery's prior work experience gave them access to a broad network of potential customers. This, together with his scientific background, was a key factor in bringing not only scientific but also economic success. However, Lyncée Tec was founded on science, driven forward by CTO Cuche who had defined the major concepts of the DHM technology--specifically its numerical features--and had co-authored the corresponding patents. In 2001 his work was recognized by the Swiss Physical Society.

Emery and Cuche relied on the support of Lyncée Tec's two boards (*refer to Figure 3*). The members of the scientific board, all still active researchers at EPFL and UNIL, fostered recognition and acceptance of the DHM technology through scientific publications and conference contributions. Their efforts were complemented by organizational support from the board of directors. Chairman Schneider directed an office of lawyers, accountants and fiscal experts, and so could be called on for advice on financial issues, while Bernard Rueger, who headed a company that sold measurement instruments through a worldwide network of distributors, contributed valuable knowledge in international trade. (*Refer to Exhibit 2 for additional information about the team members.*)

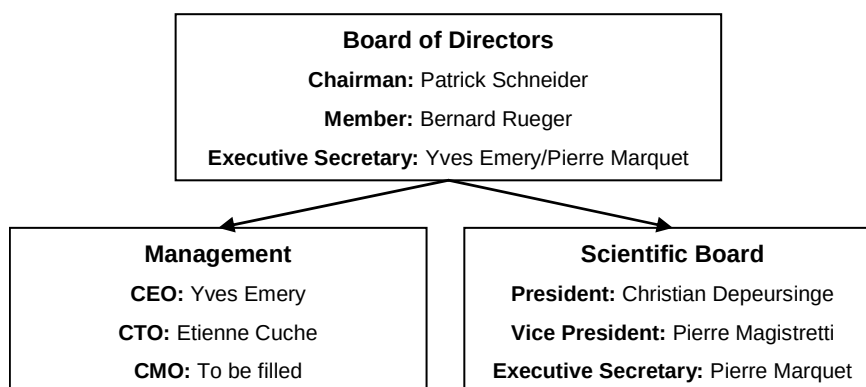


Figure 3: Lyncée Tec SA--Organization Chart

Outside Resources

In addition to the accumulated internal expertise, Lyncée Tec also relied on some external coaching and professional services: CTI,⁴ CimArk SA⁵ and

⁴ Commission of Technology and Innovation: the Swiss innovation promotion agency with a specific focus on knowledge transfer between science and industry.

⁵ CimArk SA is the cantonal agency of the CCSO network in Valais, Switzerland. CCSO is a private organization set up within the six French-speaking cantons of Switzerland to support small and medium-sized enterprises in growth and competitive strength.

Vendbridge AG⁶ helped to validate and develop the venture's strategic approach; and Pricewaterhouse Coopers (PwC) refined its administrative and financial structures. The start-up further benefited from various governmental initiatives, such as TOP NANO 21 and Nano-Micro (driven by CTI), both of which granted financial support and access to the internal resources of EPFL and UNIL. The CTI funds, in particular, secured the regular employment of three R&D collaborators until June 2006. CTI had further helped by conferring its Start-Up Label on Lyncée Tec in November 2003, which created additional visibility, boosted credibility and provided access to a broad network of industry experts and venture capitalists. Also in 2003, Lyncée Tec was ranked second in the "Lausanne Région Entreprendre" competition and was selected to be supported in the annual IMD start-up competition. Additional prizes such as Venture 2004 and the W. A. de Vigier award in 2004 increased the venture's public recognition.

Integrated in an excellent network, led by a committed management team and equipped with an innovative, proven technology, Lyncée Tec now needed to develop a viable business plan as the next part of its journey to success.

The Business Plan

Selecting Target Markets

We expect our technology not only to replace existing approaches but also to open new markets. Hence, we had to see potential customers first and talk to them in order to better understand their concerns and subsequently tap the full potential of our business.

Lyncée Tec initially visited over 100 potential customer sites in Switzerland and adjoining regions, and became aware of a broad range of possible applications, around two main industries: material and life sciences. Both industries contained several promising sub-domains, which, given the usual resource constraints of a start-up, could not be addressed at the same time. A thorough assessment of technological fit, competitive intensity, market potential and entry barriers for each domain facilitated the selection process (refer to **Figure 4**).

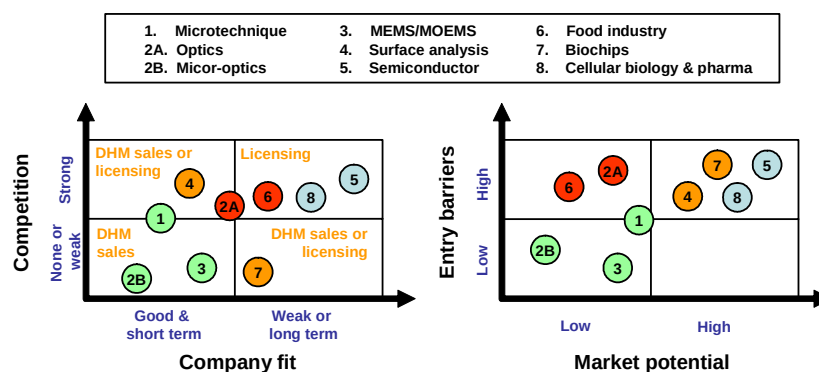


Figure 4: Market Segmentation

⁶ A service/consulting company specialized in resolving sales issues.

We have deliberately chosen not to select one single segment, for we believe a small portfolio will reduce risk in both technology and market. In future, though, we might focus on whichever segment receives the greater response from the market.

Finally, four target markets were identified from the analysis: Micro-optics (2B), MEMS and MOEMS⁷ (3), Microtechnique (1), and surface analysis and biochips (which had the same instrument specifications) (4, 7). (Refer to **Exhibit 3** for more detailed information on these four and other identified applications.)

Selecting Target Customers

The segmentation into application domains was only a first step toward making money out of the instruments. Customers, naturally, wanted to know the value-add of their investments. To answer them, Lyncée Tec needed to gather specific knowledge about the activities performed by the imaging systems. The findings indicated that the venture should further focus development efforts on satisfying two particular groups--*R&D laboratories* and *quality control* in manufacturing (refer to **Table 1**).

Our DHM offers unprecedented possibilities in the quality control domain, unlocking a market not yet served by current products. It is a unique opportunity we aim to seize.

Table 1: Value Propositions of Application of DHM in R&D and Quality Control

R&D	- DHM offers unrivaled possibilities to investigate micro and nano movements, deformations and vibrations of samples. <i>Examples</i> are the development of MEMS and MOEMS and in-vivo observations of morphological changes in biological cells. - DHM offers new possibilities for innovative research and product development in industrial academic laboratories. <i>Examples</i> are the development of capacitive membranes in micro electronics and process control in the food industry, such as observing the formation of ice cream structures
Quality control in production	- Fast and accurate quality control in manufacturing processes, which increases product quality and reduces production and warranty costs. <i>Examples</i> are the quality control of micro lenses and of antigen spots on biochips. - Increase in productivity and yield. <i>Examples</i> are the control of watch parts at an early stage of production and high throughput screening.

Although R&D laboratories already used 3D high-resolution microscopes for various purposes, production quality control had so far not been able to employ these devices regularly, since they did not capture the image quickly enough.

⁷ MEMS: Micro-Electro-Mechanical-Systems; MOEMS: Micro-Opto-Electro-Mechanical Systems: These are printed circuits with a moving mechanical part incorporated. Examples are accelerometers, pressure sensors and micro pumps.

Hence, Lyncée Tec targeted customers that were already using competitors' devices and had to be convinced to change their existing system, and on the other hand it targeted new customers that had yet to discover the virtues of DHM. This was no easy task for a start-up, which--like many others before it--did not have a track record or substantial funds. Entering the production environment, with its long lead and decision cycles, required high credibility in terms of robustness and financial backing.

However, Lyncée Tec's strategy of going proactively to customers, treating their concerns seriously, and assigning top priority to meeting market demands began to bear fruit. The majority of clients visited in various R&D and quality control settings had expressed a genuine interest in the product. More than 50% had provided Lyncée Tec with samples to analyze--at the clients' expense--and more than 25% of these had requested a quote after seeing the first images of their samples. By May 2005, Lyncée Tec reported total sales of CHF 1.5 million and 20 more orders in its pipeline--a big success for the small venture, which until now had been self-financing.

Sizing the Market

There is huge untapped potential in the quality control domain. By invading this realm we hope to get round the current stagnating tendency in the overall microscopy market.

The annual sales volume of traditional 3D high-resolution microscopes amounted to US\$1.5 billion worldwide. Yet this market lacked growth prospects. Therefore, even though its first sales and orders confirmed its hopes of being able to capture a reasonable share of the conventional market, Lyncée Tec aimed higher. Its technological edge allowed it to look to develop an entirely new clientele. Looking beyond the known, however, made it difficult to estimate the true sales potential.

Cautious market research, drawing on various sources, was required. The insights from extensive field research at more than 100 customer sites and from well over 400 phone calls were compared with the findings of contracted analysts and with information from market reports. The results depicted a reliable and comprehensive market portrait, conservatively estimating an annual demand for 150 of Lyncée Tec's microscopes worldwide after five years (*refer to **Table 2***), which represented less than 5% of the overall high-resolution system market and 25% of interferometer sales.

Table 2: Forecast Annual Sales Units for Each of Lyncée Tec's Value Activities

	Year 1	Year 2	Year 3	Year 5	Year 5
Feasibility studies	14	20	30	40	50
Customization	7	12	17	20	23
Final assembly and delivery/sale of the manufactured instrument	4	20	40	75	150
After-sales services	0	3	19	54	114

Shaping the Business Model

To convince customers of the technology and gain their trust, Lyncée Tec adopted a business model with a step-by-step approach, starting with feasibility studies, followed by customization, final assembly and delivery, and after-sales services (refer to **Figure 5**). These value activities were carried out on a go/no go basis, which meant that each step resulted in a defined delivery and was invoiced separately. This gave customers the freedom to terminate business after each milestone, and at the same time Lyncée Tec secured income.



Figure 5: Step-by-step go/no go decision process offered to customer

Step 1, the feasibility studies, served two purposes: Besides demonstrating how appropriate DHM was for meeting particular needs, they also offered a separate service to clients who did not need their own complete microscopy system. For those clients that did, however, Lyncée Tec would--in Step 2--adjust the field of view, resolution and speed of the microscope. This customization was usually concluded with a live demonstration on laboratory equipment. Once the final configuration was agreed upon, Lyncée Tec would start with Step 3--the assembly. For that it first had to order highly specialized mechanical parts, which typically had lead times of up to three months. The actual assembly, final test and shipping, by contrast, took a mere two or three days. In Lyncée Tec's current after-sales process--Step 4--services such as maintenance and calibration were offered. To streamline all steps, the venture aimed to fully modularize its components over the next two years. This would allow customers to add functionality more easily later on by purchasing additional mechanical units or software.

Needless to say, however, the venture's resources were not infinite. Soon, Lyncée Tec would have to concentrate on those activities where it added most value--this was in advancing and innovating in digital holography. All other operations, such as manufacturing the instruments and distribution, would sooner or later require partners--most likely larger or specialized organizations with the appropriate distribution capacities (refer to **Figure 6**).

It might well happen that one of these partners eventually acquires Lyncée Tec. Therefore we have to watch out and ask ourselves whether our largest competitors, for instance, are the right partners. They might just want to shut down Lyncée's operations which would be a shame in light of the efforts we have made and the funds we have gathered. Ideally we are looking for companies distributing products complementary to our DHM.

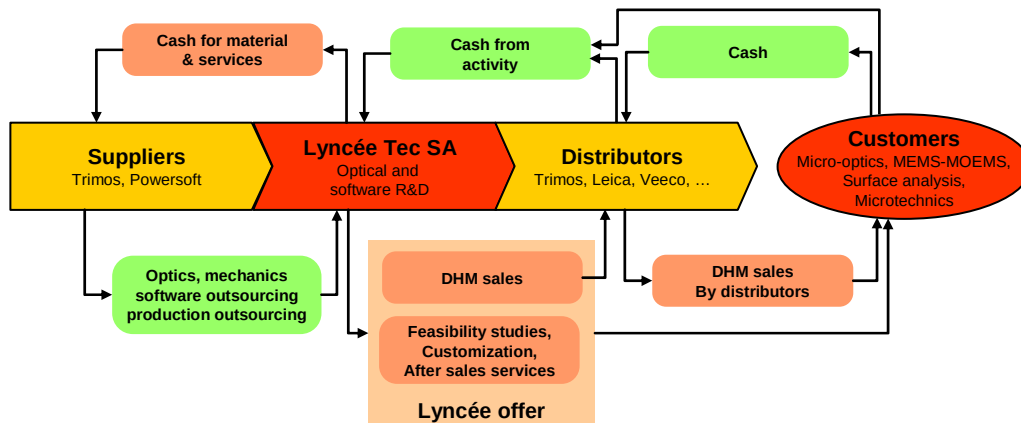


Figure 6: The Targeted Business Model

Setting Prices

Each of Lyncée Tec's four value steps was designed as an independent source of revenue. While after-sales services and customization were priced at the market average, the price of the imaging device was set lower than competitors' prices. Customer surveys had confirmed the acceptability of Lyncée Tec's price ranges (refer to **Table 3**).

Table 3: Target Price Ranges for Lyncée Tec's Value Activities

Value Activity	Target Price
Feasibility studies/engineering services (typically one day to one week):	CHF 1,500 to CHF 2,000 per day
Customization (depending on sample and degree of adaptation necessary)	CHF 50,000 to CHF 150,000
Final assembly and delivery/sale of the manufactured instrument (depending on options chosen)	CHF 150,000 for low-end products to CHF 250,000 for high-end products
After-sales services	CHF 1,500 to CHF 2,000 per day

Lyncée Tec's approach of concentrating on numerical processing rather than on complex and expensive optical systems made comfortable margins possible. The venture forecast an average net margin of 30% over the next five years, provided it received the desired financial support to scale up operations.

Establishing Distribution Structures

The extensive market research had revealed that Switzerland had a convenient number of potential customers for Lyncée Tec to begin with. For the first 12 to 18 months, sales activities had hence been confined to the Swiss region, which minimized travel, installation, marketing and after-sales costs, and thus allowed Lyncée Tec to conduct the first sales entirely on its own, without any partner.

Covering the entire value chain from pre-studies to after sales on our own will improve our understanding of the processes and their dependencies. It will subsequently enable us to manage the links more effectively once we collaborate with external partners. Moreover, we hope to build a track record and obtain revenues in short time.

As its product matured technically, Lyncée Tec had started to approach nearby Germany and France through agents and distributors. Gradual expansion to other European countries, Japan, Asia, and the US would follow as soon as marketing and training materials were further developed. Distribution would then be taken over by standard sales channels like specialized agents or production line integrators.

Since the software and optical modules were basically the same for all Lyncée Tec products, the road to success depended on finding the appropriate distribution channel for each application. Lyncée Tec had started to establish appropriate contacts early: It had even signed a first agreement through which it licensed its software to Trimos SA,⁸ a provider of industrial measurement solutions. Negotiations in other domains had also been entered into, e.g. delivering standardized microscopes for a major manufacturer of microscopic devices.

Developing Promotion Activities

Lyncée Tec's promotion strategy focused on two activities:

1. Publishing technical advances in scientific papers and attending conferences which would add to the recognition of the technology and hence serve Lyncée Tec in the long run.
2. Traditional advertising in specialized public magazines, on the Internet, in demonstration CDs, in marketing brochures, etc. This aimed not only to make Lyncée Tec's DHM as well known as the acronyms AFM or SEM but also to tie the name Lyncée Tec inextricably to the label DHM.

So far, most customer contacts had either come through Lyncée Tec's broad network or they were remnants from its initial field research. To put customer acquisition on a firmer footing, the start-up would soon have to add marketing capacity. Lyncée Tec planned to recruit a senior marketing director in the near future and later on to hire account managers responsible for the individual application domains.

Funding the Venture

Lyncée Tec had been created as a limited company with a share capital of CHF 125,000, split into equal shares between the five co-founders. Options for an undisclosed percent of shares had been granted to EPFL in exchange for licenses. The options had not yet been exercised at this stage.

⁸ Trimos SA is headquartered in Renens (VD), Switzerland

Lyncée Tec's current operations were entirely self-financed, meaning its largest cost elements like labor, intellectual property and material costs were fully covered by sales. The breakeven had proved stable and was likely to be boosted by the forecast income of CHF 1 million in 2005.

However, if Lyncée Tec wanted to attain the estimated profit margins of up to 30% within the next five years, it had to boost its sales volume. This would require investments in new facilities outside EPFL, new equipment and marketing capacity. The additional funds would also allow the start-up to commit to industrial projects that would subsequently enforce its credibility and enhance its market visibility.

A careful cash flow analysis that considered the investments necessary to pursue Lyncée Tec's operational plans (*refer to **Exhibit 4***) revealed the need for CHF 1.3 million over the next 24 months.

Outlook

Lyncée Tec had shown staggering progress over the last 18 months. It was operating at breakeven, achieved solely from customers' money, and would likely survive without external investments at the moment. Yet the question was, for how long? Emery was aiming for long-term growth, and even though a future trade sale had not been ruled out as a potential exit option, it was not a near-term scenario.

On the other hand, Emery knew that time was against Lyncée Tec. So far, competitors had not reacted, but sooner rather than later one of them would be attracted by the potential of the new market. And when that happened, any one of Lyncée Tec's competitors had the financial strength to outplay it. Lyncée Tec had to grow more aggressively to capitalize on the opportunity.

Emery picked up the phone and dialed the VC's number.

Exhibit 1 Major Competing Technologies and Firms

Competitive Technique	Imaging Description	Major Competitors	DHM in comparison to competitor (+)/(-) advantage/disadvantage of DHM
SEM (Scanning Electron Microscope)	Electron beam fired at sample and X-rays reflected back	Veeco (USA), JEOL (USA), LEO (USA), Hitachi (USA), KLA Tencor (USA)	(+) non-invasive, higher image acquisition rate, better axial resolution, larger measurement range, adapted to manufacturing processes, lower utilization costs and price (-) lateral resolution is limited to 300nm
AFM (Atomic Force)	Similar to SEM but use of micro fabricated probe	Veeco (50% of market), JEOL, NT-MDT (Russia), Omicron (Germany), Nanosurf (Switzerland)	(+) strictly non-invasive, faster, larger measurement range, adapted to manufacturing processes, lower utilization costs and price (-) lateral resolution is limited to 300nm
OM (Optical Microscopes)	Glass lens used for simple magnification	Leica, Nikon, Olympus, Zeiss	(+) strictly non-invasive, higher image acquisition rate, much better axial resolution, lower price than an LSCM (-) no morphological sectioning yet
Inferometers	Use light source and measure reflected phase change of source	Zygo (USA), Veeco, Toray Engineering (Japan), Fogale (France), Atos (Germany), Nanofocus (USA)	(+) higher image acquisition rate, easier to use, adapted to manufacturing processes, lower utilization costs and price (-) DHM is not at same technological maturity level
CPS (Contact Probe Systems)	Mechanical probe touches surface and records movements	Veeco, KLA Tencor, Zeiss	(+) non-invasive, better axial resolution, higher image acquisition rate, lighter and more compact, 3D surface measurement (-) DHM is not ready for macroscopic measurement
SMS (Specific Measurement Sensors)	Lasers scan a surface	Zeiss, Werth Messtechnik, KLA Tencor, Cotec, Nanofocus, Infinitesima	(+) less invasive, better axial resolution, higher image acquisition rate (-) DHM is not at the same technological maturity level as most of the sensors
Other holographic systems		Holo3, Tropel, nLine, Extreme diagnostic, lambda-x	(+) better resolution than usual holographic systems, higher image acquisition rate, adapted to manufacturing processes (-) DHM not at the same technological maturity level

Source: Company information

Exhibit 2 Management Team, Administrative and Scientific Board

Management

Yves Emery, CEO, co-founder, holds a PhD in Physics and a Business Administration postgraduate certificate from HEC-UNIL. He has worked for several years as director of R&D and production in two start-ups in the medical industry.

Etienne Cuche, CTO, co-founder, holds a PhD in Physics (development of the DHM). He has long-term experience in the practical application of DHM and is the original author of the DHM software. Cuche has coached more than 20 diploma graduates and 4 PhD students in the development of the DHM technology.

Scientific Board

Professor Christian Depeursinge, co-founder and president of the scientific board, holds a PhD in Physics and is the leader of microvision and microdiagnostic group in the Institute of Applied Optics (IOA) at EPFL, where he also teaches courses in Optical Design. He has initiated DHM technology development at EPFL and performs research in “Coherence Imaging Techniques” applied in particular in nano-techniques, nano-diagnostics and nano-assembly in biology, living tissues analysis and spectroscopy and “in vivo biopsy” techniques.

Professor Pierre Magistretti, co-founder and vice president of the scientific board, holds an MD from the University of Geneva and a PhD from the University of California, San Diego. He is director of the Psychiatric Neurosciences Center and co-director of the Institute of Physiology at UNIL. He is former president of the Federation of European Neuroscience Societies (2002–2004) and on the editorial board of six scientific journals. He initiated the application of the DHM technology to the domains of biology and neuroscience.

Pierre Marquet, co-founder and executive secretary of the scientific board, received his Master in physics from EPFL in 1991 and his MD-PhD from UNIL. Among other awards, he received the “Prix jeune chercheur européen 2001 de la société française des Laser médicaux.” Currently he is group leader of Prof. Magistretti’s research team at UNIL.

Board of Directors

Patrick Schneider, chairman, heads Ofisa, a law, tax and accounting company of 100 people, and hence brings with him broad experience in negotiations, finance and law.

Bernhard Rueger, owner and executive director of Rueger SA, a company of more than 170 people, with subsidiaries in 4 countries and distributors worldwide. He is a member of an institutional investment committee and is experienced in international business development.

Source: Company information

Exhibit 3 Potential Application Segments of Lyncée Tec's DHM Technology

Applications in Material Science

- **Microtechniques and micromechanics**

Potential: Quality control in manufacturing processes for micro parts, e.g. in the watch industry (spiral springs in watches).

Advantages: DHM systems can provide objective and quantitative 3D information within a tenth of a second.

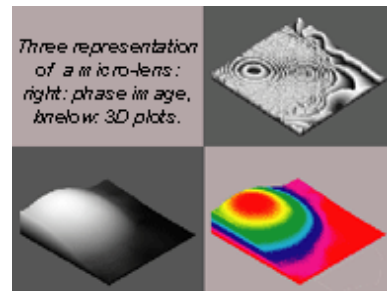
Current situation: Quality controls are done manually (subjectivity), by slower systems (LSCM and specific measurement sensors) or in some cases by instruments providing 2D images (optical microscopes).

- **Optics & micro-optics**

Potential: R&D and quality control of transparent objects. Lyncée Tec is in contact with six companies in this domain, two in optical glasses and four in plastic micro-injections. All are interested in the systems for their quality control.

Advantages: DHM products can detect nano or micro defects on the surface of and inside a sample in a tenth of a second, even with high aspect ratio samples.

Current situation: Micro-optic manufacturers do not have satisfactory systems for controlling entire wafers of thousands of micro-optical elements. Optical glasses are often controlled manually with simple magnifying glasses.



Micro-lenses and binary gratings

- **Micro-Electro-Mechanical-Systems (MEMS) and Micro-Opto-Electro-Mechanical-Systems (MOEMS)**

Potential: R&D possibilities and quality control of moving mechanical parts. There are advanced contacts with four companies interested in DHM systems for their R&D, and at a later stage, for their quality control.

Advantages: Thanks to their high acquisition rate and 3D resolution, DHM products are able to visualize micro-movements or micro-vibrations.

Current situation: None of the current systems simultaneously has both the required resolution and speed to enable 3D measurement of micro movements. Stroboscopic interferometers are the main competitors.

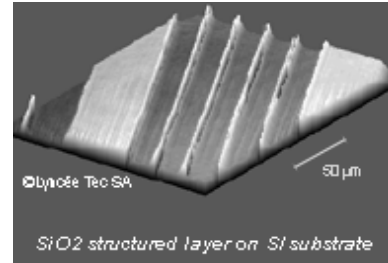
Exhibit 3 (continued)

- **Surface analysis, coating, thin film**

Potential: Alternative solution for R&D and an interesting tool for high-resolution quality control in the manufacture of thin film and coating. DHM systems can for instance measure layers of SiO₂ on silicon substrate, which is not possible with interferometers.

Advantages: High axial resolution, speed, 3D and ease of use are key elements for users in R&D and the industrial environment.

Current situation: Systems are too slow and not accurate enough to be used in a manufacturing process (interferometers, AFM and SEM).



SiO₂ structure on silicon wafer

- **Semiconductors, front end and back end**

Potential: This is a large market with well-established technologies, big players and various applications such as wafer quality control, lithography quality control, packaging and data storage. Lyncée Tec has identified applications where DHM products can add value.

Advantages: Speed and resolution.

Current situation: Various types of systems, most of which are slow (SEM and interferometers). A more detailed analysis of this market still has to be done to determine if and when Lyncée Tec should try to enter this market.

Other segments in material science to be served long term are industrial metrology (macroscopic measurements), measuring instruments for multi cantilever AFM, and cryptology applications. Strategic partners would be needed to develop applications for these domains.

Applications in Life Science

- **Food industry**

Potential: R&D for big food companies. A contract for specific images and movies could be signed with one of the big players.

Advantages: Tests have shown that DHM products are suited to investigating the evolution of food substances and their stability at nano and micro levels thanks to their non-invasive and very fast measurements.

Current situation: Depending on the sample and the information to be retrieved, companies use various types of microscopes (confocal, fluorescence, etc.), which are of limited use due to their invasiveness.

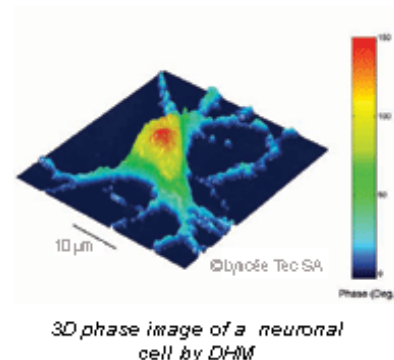
Exhibit 3 (continued)

- **Cellular biology**

Potential: R&D in public and private laboratories, e.g. observation of morphological modifications of biological cells due to electrical or mechanical stimulation or through substance perfusions.

Advantages: Non-invasive, real time, 3D observation of cellular morphological change.

Current situation: Systems are incapable of invasive observations.



- **Biochips**

Potential: Provision of in-production quality control for faults and dust on the substrate of biochips.

Advantages: Non-invasiveness, high axial resolution, speed, 3D and ease of use are key elements for users in R&D and the industrial environment.

Current situation: The only available system is ellipsometry, which needs more than one minute per spot (biochips can have several thousands of spots).

- **Pharmaceutical industry**

Potential: R&D in public and private laboratories, and high throughput drug screening and fundamental research in pharmaceutical companies. Lyncée Tec could sign a contract with a pharma company for a complete system able to recognize and analyze cancerous cells.

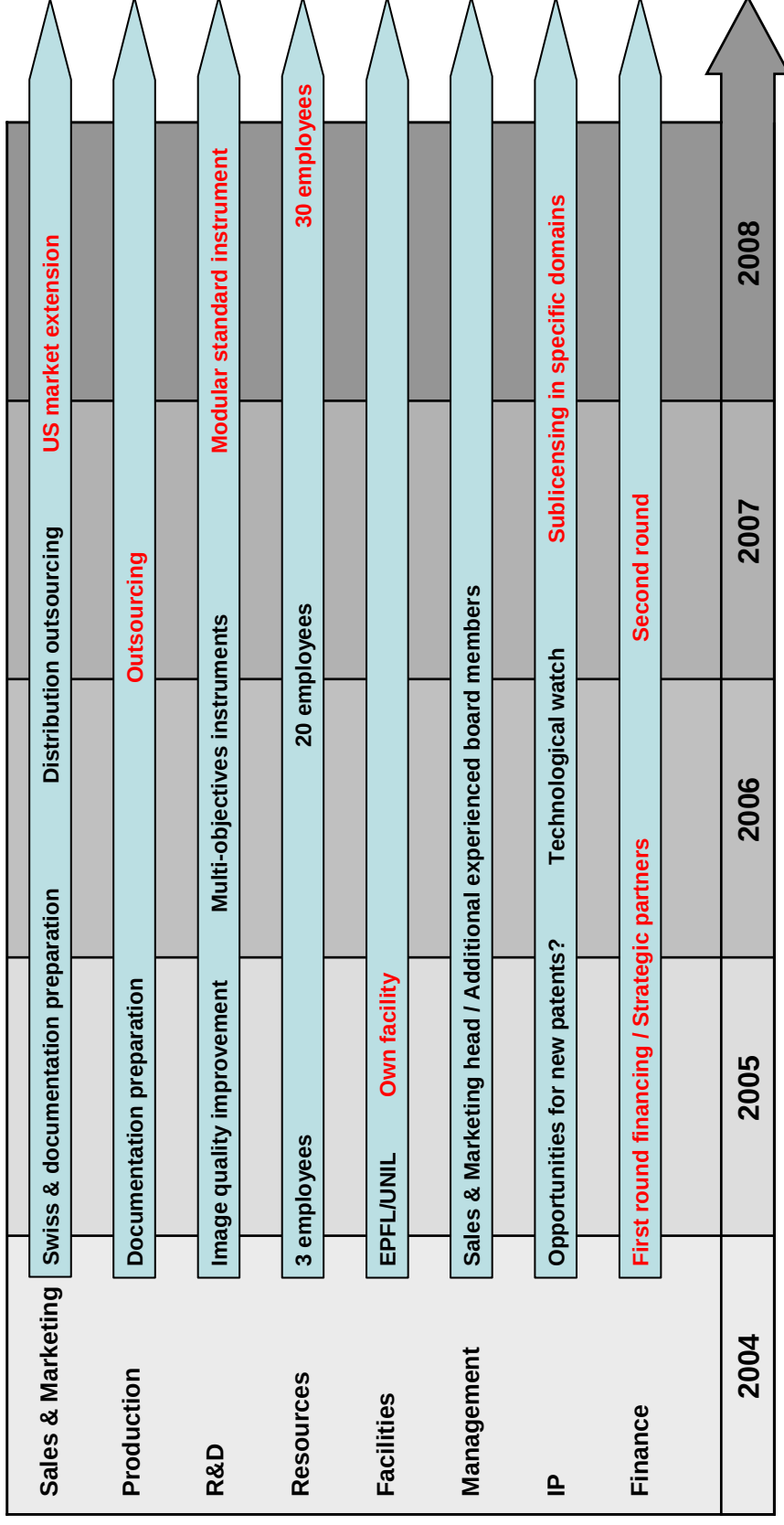
Advantages: Non-invasive, and the high resolution in the axial direction allows the detection of the density of a cell's nucleus to characterize the pathology of cells.

Current situation: Systems are incapable of invasive observations.

Additional life science segments with huge long-term potential are biochip readers and tomography applications. Additional technical developments are needed to address these applications.

Source: Company information

Exhibit 4 Operation Plan



Source: Company information