Laser Vision Correction
Industry Analysis
And Forecast

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BBUS 479 New Technologies

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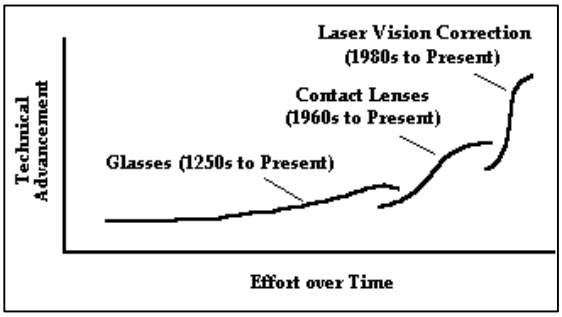
EXECUTIVE SUMMARY

The world has seen a progression of vision correction technologies over the past several centuries. Spectacles were used in ancient Europe and China as mere pieces of fashion 2000 years ago. To improve sight, glasses came into use in Arabia in the 11th century, finding their way to Europe 200 years later. This was a true innovation and a considerable advancement in technology. In more recent times, contact lenses and surgical alternatives have become commonplace in our society. *Radial Keratectomy* surgery (RK), developed in Russia in the 1970s, was one of the first surgical procedures to correct vision. In this procedure, up to eight radial cuts are made in the cornea of the eye to correct for myopia (nearsightedness). This alternative to glasses or contacts was quite attractive to many people. The number of RK procedures rose from 50,000 performed in 1990 to 350,000 in 1995. But there are drawbacks to this type of operation.

The patients' vision is not always corrected with ideal results. Some patients talk of seeing "halos" or "starbursts" around light sources at night (as with seeing headlights when driving). Others had to have several follow-up surgeries to correct for shortcomings in the procedure and experienced pain, irritation, and dryness of the eye. An alternative was necessary to meet the growing demand for a quick, painless, and results-driven procedure. Enter the laser.



About the time that RK was introduced to the U.S., an IBM scientist developed the excimer laser for etching semiconductor chips. Soon, excimer laser technology was applied to eye surgery, and the laser vision correction industry was born. Laser vision correction is truly innovative. Instead of aiding the eye to see correctly with artificial lenses (glass or plastic), or cutting the cornea with a knife (RK), the excimer laser aspires to correct vision by sculpting the surface of the eye permanently. Currently, laser vision correction is in its infancy, yet there have already been several incremental advancements that suggest that it is becoming the preferred method for vision correction.

When analyzing the refractive surgery market, one must examine the ultimate target market - those 150 million people who would like to trade their traditional eyewear for something better. The force driving these developments is clear: people want to be able to see well, whether to correct for a disability (nearsightedness, for example), or to help create a more comfortable lifestyle. This paper examines these issues with the growing field of laser vision correction. It is organized to cover the following topics:

- Methodologies use to collect industry data,
- Key industry drivers,
- Vision correction history,
- Vision correction procedures,
- Vision correction technologies,
- The market players and industry details,
- Market trends,
- Technological competitors,
- Four Scenarios.

The final portion, "Four Scenarios," contains our analysis and forecasts for the future of this industry. In addition, Appendix A, "Anatomy of the Eye & Definitions," will help to identify and understand key terms and items described in this paper.

METHODOLOGIES USED TO COLLECT INDUSTRY DATA

Our group has studied this industry for six weeks between October to November 1998. Our research included the following items:

- We read and examined over 100 articles from:
  - ✓ American Academy of Ophthalmology
  - ✓ Journal of Refractive Surgery
  - ✓ Primary Care Optometry News
  - ✓ Review of Ophthalmology
  - ✓ Ocular Surgery News

- We attended an information seminar and viewed a live LASIK procedure at The Laser Center (Lynnwood, WA) on Thursday, November 4, 1998.

- We interviewed several experts (those who were in some way connected to the industry). This included:

  Professionals:
  - ✓ Dr. Richard Bowe, Ophthalmologist, Pacific Northwest Eye
  - ✓ Dr. Devin Harrison, Ophthalmologist, Assistant Professor, Dept. of Ophthalmology, University of Washington
  - ✓ Dr. William Hancock, Ophthalmologist and Medical Director of The Laser Center (Lynnwood, WA)
  - ✓ Don Galer, Business Manager, The Laser Center (Lynnwood, WA)

  Patients:
  - ✓ Tracy Bittner
  - ✓ John Wallace

Appendix J, "Works Cited," contains a complete source list used to develop this industry analysis. Note that sources are directly cited within parenthesis through the text.

KEY INDUSTRY DRIVERS

There are several key issues that drive this industry.

Technological Advancement

Lasers were initially developed for industrial applications. As the technology matured, it spread into medical applications. Lasers have been used to treat serious medical conditions in hospitals for over twenty years. In the last decade, the technology has evolved into a new generation of laser that "has been developed to dissolve tattoos, kill follicles, smooth out facial lines and adjust the cornea edges of the eye." (Rosenberg)

Consumer Demand

According to some estimates, there are about 90 million Americans who suffer from myopia (nearsightedness) and an additional 60 million that suffer from hyperopia (farsightedness). There is evidence that consumers are adopting laser vision correction technology rapidly. This acceptance fuels the demand for better laser technology. Laser manufacturers must perfect their technologies to improve outcomes and reduce discomfort in order to retain customers and sustain market growth.

Market Supply -- Greed

With a market potential of $2 billion a year in revenue, laser manufacturers are racing to bring the best technologies to the market. According to Henry W. Singer, "Conservative estimates place the number of refractive excimer laser procedures at 1.1 million annually by 2000. Aggressive estimates are for 2.7 million procedures annually by 2000." (Singer) Competition for revenue drives laser manufacturers to pursue technological advances.

Consumer Life Style

People are pursuing healthier lifestyles in an effort to look better and extend their youth. A major component of a healthier lifestyle is physical exercise, which people prefer to take in the form of sports. Most surgical patients have laser vision correction because traditional vision aids (eyeglasses and contacts) hinder their ability to participate in sports.

Poor vision is one of the top ten forms of disabilities in the U.S. Severely myopic people are disadvantaged every bit as much as hearing-impaired people, and many choose laser surgery to alleviate their myopia.

Safety concerns also compel people to undergo vision correction surgery. Some people who are legally blind worry that they will not survive an emergency situation if they cannot see because their traditional vision aids are unavailable or become damaged.

Finally, people in some professions need to be able to see without aid. Firefighters and police, for example, may be more effective if they are relieved of dependence on eyeglasses or contact lenses.

Economic Factors

Laser vision correction is expensive. It is expensive to provide and it is expensive to undergo. Determining who will pay for laser vision correction is a driving force in the industry, whether it is private medical insurers, HMOs, or individuals. Costs and prices of laser vision procedures are heavily influenced by several economic factors: rate of technological advancement, productivity and knowledge gains, and economies of scale.

Food and Drug Administration

The Food and Drug Administration (FDA) plays a vital role in the laser industry. Like any other medical device, laser equipment has to be rigorously tested before it is approved for use. Laser makers have to conduct clinical trials and document the results to prove that their equipment is effective, beneficial, and does no harm. Without adequate data, results, and documentation, the FDA will not approve the laser for public use. For example, in May 1998, the Autonomous laser did not receive FDA approval due to insufficient documentation and incomplete paperwork. However, the approval was granted in October following satisfaction of documentation requirements. Delays in FDA

approval of new products could harm laser makers financially and weaken their competitive advantage.

To mitigate the effects of stringent FDA regulations, many laser companies seek approval for early applications abroad. Generally, they market their lasers in countries with fewer governmental regulations, like Canada and many of the European countries. The laser used for the PRK procedure (discussed later in this paper) was in use in Canada for three years before it gained FDA approval. Foreign markets provide a friendlier environment for conducting tests and collecting data to be used in support of applications for FDA approval.

VISION CORRECTION HISTORY

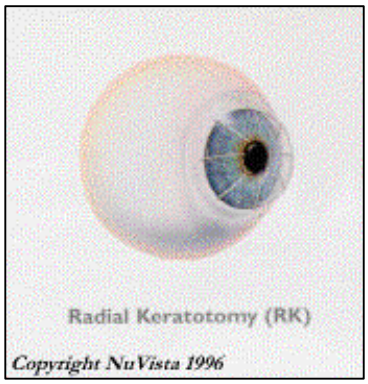
There have always been people who do not see clearly. Over the last 730 years vision correction technologies have developed to help people achieve normal vision. Roger Bacon, an English friar and scientist, developed the first form of vision correction in 1268, suggesting the utilization of lenses for optical purposes. In Europe eyeglasses first appeared in Italy. In 1784, Benjamin Franklin, an American scientist, developed the first bifocals. This development allowed people to see distant and near objects with a single pair of glasses. The first eyeglass lenses were made of glass but now plastic is more commonly used for lenses. These plastic lenses are much lighter than glass and are shatterproof. (Encyclopedia Britannica)

The next technology for vision correction was the contact lens. Adolf Fick developed the first contact lenses in 1887. Since these lenses were made of glass, they were very uncomfortable and could not be worn for long periods of time without problems. Once optical devices were developed to measure the curvature of the eye, contact lenses became much more comfortable. In 1948 Kevin Tuohy developed the first contact lenses made of plastic (Encyclopedia Britannica).

The following years produced dramatic changes in the original contact lenses. In the 1970's soft lenses that provided greater flexibility were created from water-absorbing plastic gel. They were also much more comfortable to wear than other lenses because they allowed oxygen to penetrate the eye's surface. In the 1980's extended wear lenses were developed. These lenses were designed to be worn for several weeks at a time without removal. Hard lenses were developed for people with astigmatism. The hard lenses are very different than soft lenses. For example, hard lenses cover only the pupil of the eye and are much smaller than the soft lenses that cover the iris and the pupil of the eye. Soft lenses are much easier to handle, but their delicacy makes them more susceptible to damage and they require more maintenance than hard lenses. Contact lenses eliminate the object size distortion commonly experienced wearing thick corrective lenses.

VISION CORRECTION PROCEDURES

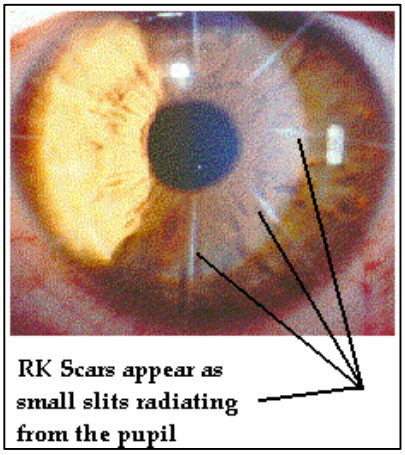
RADIAL KERATOTOMY (RK)



Radial Keratotomy (RK) was first introduced in North America in 1978. This surgical procedure represented a new technology that would eliminate the need for glasses or contact lenses by correcting vision problems. This process decreases myopia "by surgically changing the curvature of the cornea over the pupil" (www.eyenet). A surgeon makes multiple deep incisions in the cornea in a radial pattern using a microscope and microscopic instruments. (www.eyenet)

Since this technology was introduced, several hundred thousand people have undergone the RK procedure. Approximately 85% of people who have had RK can pass a driver's test that requires 20/40 vision. (www.eyenet)

RK surgery is an outpatient surgery that takes approximately 30 minutes to perform. When a patient arrives for RK, they are usually given medication to help them relax. Next, an anesthesia is given in the form of eye drops to numb the eye. Before the surgeon begins the procedure, he or she will mark the "optical zone" on the patient's cornea. The optical zone is the part of the cornea that people actually see through. It is important that no cuts are made in this area. The surgeon then measures the thickness of the patient's cornea to determine how deep to make the cuts. In the final step of the procedure the surgeon makes precise incisions with a "calibrated diamond blade." (www.eyenet)



The pressure from inside the eye causes the area around the incisions to bow as the center of the cornea flattens. This flattening of the cornea reduces the refractive power of the cornea and allows light rays to focus directly on the retina. (www.eyenet)

When the procedure is over and the anesthesia has worn off, the patient may feel some pain. The surgeon provides eye drops to alleviate the discomfort. The patient's eyes may feel gritty and be sensitive to light for a few days following the procedure. In addition, the patient may look a little red around the eyes.

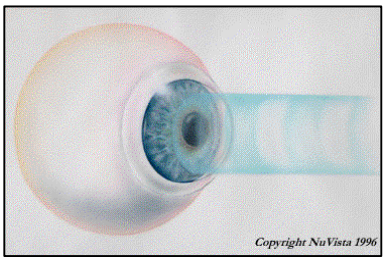
To avoid infection, the patient will use steroidal eye drops for several weeks following the RK procedure. One major problem with the RK procedure is that patients are unable to have enhancements to the procedure and it is not reversible. This means that if the correction results in less than perfect vision, the patient must live with it. In addition, RK also has many side effects. Table 1 below describes some of the side effects and risks associated with the RK procedure.

Potential problems resulting from RK (www.eyenet.org)

SIDE EFFECTS	RISKS
• Fluctuating vision, during the first months after surgery • A weakened cornea, more vulnerable to rupture if hit directly • Difficulty in fitting contact lenses • Glare or starburst around lights • Temporary pain • Infection	• Cataract • Persistent pain • Serious infection • Traumatic rupture of an incision • Loss of vision

Table 1

PHOTOREFRACTIVE KERATECTOMY (PRK)

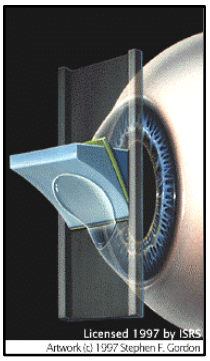


The next technological advancement in refractive surgery for vision correction was a radical departure from the existing techniques. Demand for a quick and painless procedure drove the development of an alternative to RK. During the middle eighties, a procedure promising more accuracy than RK was under investigation. This new procedure utilized an excimer (Argon and Fluoride) laser that projected a cool ultraviolet beam. This procedure was called photorefractive keratectomy (PRK). Consumers preferred this PRK procedure to the RK procedure because PRK used a laser and RK

used knives. Since its inception, there have been over half a million procedures performed worldwide. (Brown, 1998) The excimer laser precisely sculpts the surface of the cornea to correct vision problems. The procedure takes about 10 minutes to perform. During the procedure, the laser beam is applied to the patient's eye and the cornea is reshaped to duplicate the contact lens or glasses prescription of the patient.

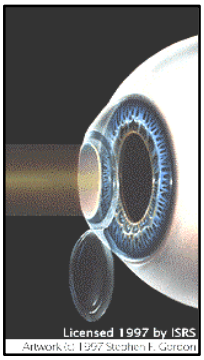
Before the PRK procedure begins, the eye is numbed with anesthesia. Next, a lid speculum is placed in the eye to keep the patient from blinking while the procedure takes place. The surgeon then uses an excimer laser to remove (ablate) a small amount of corneal tissue. The reshaping of the eye by the laser changes the refractive power of the cornea to improve the patient's vision. The laser procedure takes about 30 seconds per eye and is completely painless. After the procedure, the patient is given anti-inflammatory eye drops to reduce discomfort and swelling. During the healing process, the patient may have to use steroidal anti-inflammatory eye drops for up to four months. Shortly after receiving PRK, a patient may experience a gritty sensation in the eye for 24 to 48 hours. Three to five days following the PRK treatment, the patient will notice a marked improvement in vision. (www.lzr.com)

LASER ASSISTED IN-SITU KERATOMILEUSIS (LASIK)



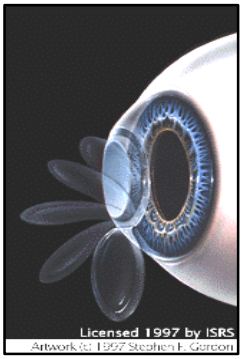
The newest laser vision correction procedure is Laser Assisted in-Situ Keratomileusis (LASIK). Surgeons began to take interest in this procedure because it could correct a higher degree of nearsightedness. LASIK surgery combines the process of PRK with the use of a microkeratome, a blade resembling a guillotine that is used to remove the top layer of corneal tissue. Microkeratomes have been in use since the 1960s. LASIK requires a higher degree of surgical skills than PRK.

As the LASIK procedure begins, a suction ring is placed on the patient's eye to secure it and maintain internal pressure when the corneal flap is created. The microkeratome creates a corneal flap that remains hinged by the 'nose' beneath the upper eyelid. This microsurgical instrument is very similar to a carpenter's plane. It is a blade



and it creates an incision. The process of creating a corneal flap has been done for many years is considered safe and stable, although all incisions carry a risk of infection or other complications.

Once the corneal flap is laid back to expose the inner layers of the cornea, the excimer laser is used to reshape the patient's cornea to mimic their eyeglass or contact lens prescription. When the laser process is complete, the corneal flap is returned to its original position. It adheres naturally because of the normal suction within the cornea.



Following the LASIK procedure patients are normally placed on antibiotic and anti-inflammatory eye drops for four days. LASIK has revolutionized the public perception of surgical vision correction. No other previous surgical procedure allowed a patient to receive treatment with immediate results. Dr. Siepser from The Laser Center has high regard for the LASIK procedure:

> "I have never had an operation that works as well as LASIK," he stated. "A year ago I was still performing a few PRKs, but today I am reluctant to do any. After all, what other operation has a patient walk into a room, look at a clock they are unable to read, lie down, have the procedure, sit up and be able to read the clock?" As stated by Dr. Siepser.

See Tables 2 and 3 on the following pages for a comparison of the risks and advantages of PRK and LASIK.

A major consideration with all three procedures, RK, PRK, and LASIK, is that there is no guarantee the patient will have 20/20 vision after undergoing one of these procedures. In fact, patients occasionally experience either under or over correction and need to return for an 'enhancement.' Moreover, if a myopic patient experiences an over correction that results in farsightedness, it is more difficult to correct. In a worse case scenario, a PRK or LASIK procedure could cause an "irregular astigmatism" where the patient would have to use contacts to correct their vision. (www.lsikny.com)

Finally, as with any surgery, it is impossible to determine how long the healing process will take. But, as these techniques are used for a longer period of time, the technologies will improve and the surgeons will become more proficient.

Comparative Risks of PRK and LASIK (TLC The Laser Center Seminar)

RISKS	PRK ODDS	LASIK ODDS
Discomfort	(1:10)	(1:50)
Infection	(1:500)	(1:500)
Over/under correction	(1:100)	(1:100)
Haze and/or night glare	(1:100)	(1:100)
Blindness	No reported cases to date. Est. Risk is 1 in 10 million	No reported cases to date. Est. Risk is 1 in 1 million.

Table 2

Advantages of LASIK over PRK (The Laser Center, Inc.)

- Faster visual recovery
  - ✓ Back to work in 1-3 days for LASIK
  - ✓ Back to work in 2-3 days for PRK
- Less risk of discomfort after surgery
- Less risk of infection
- Less risk of corneal haze or scarring
- Can be performed bilaterally
- Less need for anti-inflammatory eye drops
- Fewer post-operative visits
- Ability to treat a wider range of prescriptions
- Enhancements can be done within one month

Table 3

VISION CORRECTION TECHNOLOGY

There are several steps involved in sculpting the stromal bed of the cornea. Each activity can be accomplished in a variety of ways. These variations are the bases for differentiation among laser manufacturers.

Measure and map the eye

Pachymetry (measuring corneal thickness) and nomography (three-dimensional charting) are the eye measurement and mapping technologies required to produce custom ablation patterns for each eye.

Determine the alterations necessary to produce sharp images

An ablation profile is created by software in the laser system to define the depth and diameter of the treatment area. Only one profile is in use in the U.S. at this time. (Fanelli) The ablation *pattern*, which is different for each eye, enhances the basic profile with instructions on size, shape and placement of the ablations, number of passes over the treatment area, depth and size of each successive pass. The algorithms for creating the ablation patterns are the differentiation factor among laser systems. As such, they are proprietary, or at least patented. (Fanelli)

Program the laser to make the alterations

Most lasers require manual data entry; hence the FDA-mandated training requiring a surgeon to know how to maintain and program the laser, in addition to operating it.

Expose the stroma

At present, there are two methods to remove the epithelium: with a blade, or with a laser. The microkeratome is the blade mechanism used in LASIK procedures. It can be controlled manually, or programmed by computer. It can be used to slice off the epithelium, or to stop short of complete severance leaving a replaceable flap. The microkeratome is the innovation that differentiates PRK and LASIK. Two types of blade replacement technologies under development: waterjet and laser cutting

tools. Laser ablation of the epithelium (instead of manual scraping) would improve PRK. It would require the development of a device to alert the laser when it reaches stroma.

Remove layers of stromal tissue

Hot or Cold: Ultraviolet Excimer laser vaporizes stromal tissue to remove it. This type of laser produces no heat. An Infrared Holmium YAG laser gently heats the corneal collagen. It is primarily used to treat hyperopia, but trials are underway for myopia and astigmatism treatments.

Spot or Ray: Most laser beams currently in use are rectangular rays that scan the cornea from one side to the other. Precisely controlled small beam and spot shaping technology is emerging now.

"Hold still, now:" High-speed laser radar eye tracking is now beginning to be incorporated into lasers. This technology compensates for inadvertent eye movement and thereby produces a much more precise ablation.

Delivery Systems

The excimer laser delivery system is a large apparatus that requires the patient to lie on a specialized table with their head in restraining gear. The appearance of this system is similar to the equipment used in a traditional eye examination. It requires the radar eye tracking technology described above. The optical component of the delivery system is composed of some number of shutters of varying sizes and capabilities. The configuration and operation of the optic system is another differentiator of the laser product.

Protect the stroma while cornea heals

The loss of the upper layers of the cornea (the epithelium and the Bowman's membrane) inherent in PRK necessitated the use of steroidal eye drops for many months following the procedure. Corneal bandages similar to contact lenses have recently been developed. LASIK does not leave the stroma exposed, so steroidal drops are required for less time.

MARKET PLAYERS

The medical laser equipment industry is experiencing a period of heated competition, marked by acquisition and expansion. The larger firms are swallowing up smaller ones to obtain their technologies. In the medical field, where research and FDA trials can consume years of time and millions of dollars, buying a company with an already approved technology is cheaper than developing a technology from scratch. We will focus our attention on five companies: VisX, Inc., Summit Technology, Inc., Pillar Point Partners, Sunrise Technologies International, Inc., and Coherent, Inc. We will discuss their business strategy, marketing strategy, and their advantages, assets and technologies. For your reference, Appendix B offers a brief schedule of the technologies and acquisitions held by each of our highlighted companies.

VISX, INCORPORATED

In 1986, Dr. Charles Munnerlyn and Dr. Stephen Trokel founded VisX, and Dr. Francis L'Esperance founded Taunton Technologies. Taunton acquired VisX and all of its patents in 1990. Among them, these three men hold fifty-six critical patents for technologies and procedures relative to laser eye surgery. All of them have since left the business.

Business strategy

VisX places a high priority on customer service, and equipment sales and service. To avoid the difficulties inherent in being both equipment supplier and service provider, the company has chosen to stay out of the service delivery business. This strategy could limit VisX's profitability when the equipment market becomes saturated. Most of VisX's revenues have come from licensing fees and patent royalties. (Pethokoukis, Burton)

Marketing strategy

VisX's marketing strategy targets individual ophthalmologists and independent vision centers. They even offer a "trade-in" discount - on Summit Technology equipment.

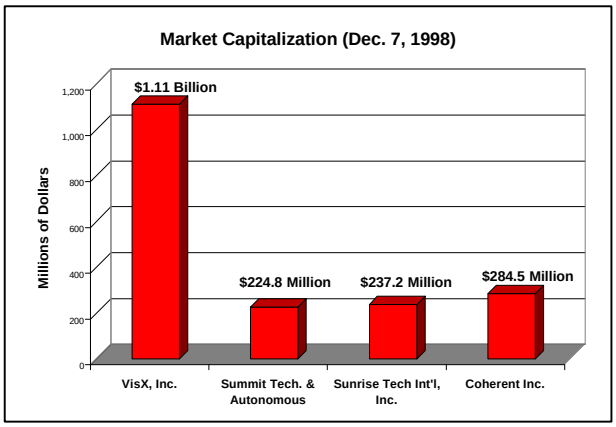
Advantages, Assets, Technologies

VisX products have received more FDA approvals than any other company's products. With each new approval, VisX gains more experience in the process, which speeds and eases the next approval process. To date, VisX equipment has received approvals to perform the following procedures:

- Mild to moderate myopia with astigmatism
- High myopia with astigmatism
- Hyperopia

Doctors have expressed a preference for the VisX laser over the Summit Technology laser. They think it is a better product despite its considerably higher cost ($500,000 versus $350,000). (Singer) Three quarters of all PRK and LASIK procedures done in the U.S. are done with VisX equipment. Worldwide, there are over 350 VisX lasers in use in forty countries.

As a corporation, VisX is the patent leader with over 125 patents on systems and applications. VisX reigns among its competitors in market capitalization (illustrated to the right), giving it the financial strength to withstand competitive pressures and afford some margin of error in market and business strategies.



SUMMIT TECHNOLOGY, INCORPORATED

Summit Technology, Inc. was also founded in 1985 with a stated goal of delivering simple, safe, reliable systems. It enjoyed industry leadership for several years, until it entered into an agreement with VisX, Inc. in 1992. (This agreement is discussed in the next company review, Pillar Point Partners.)

Business strategy

Summit's current goal is to regain it's once-held technological and market leadership position by acquiring new technologies and marketing tools. They have acquired Lens Express, Krumeich-Barraquer, and Autonomous Technologies all within the last year.

Marketing strategy

Summit targets consumers directly through its Summit Vision Centers. By marketing service delivery directly to consumers, Summit hopes to create a demand 'pull' for its lasers. Summit, the service provider, can offer lower procedure prices because its laser costs less to own and operate, and because there is no per-procedure royalty to be paid on their own equipment. Independent doctors who have purchased Summit lasers have voiced displeasure with this practice. They feel that Summit is competing unfairly. (Singer)

Advantages, Assets, Technologies

Summit received the first FDA approval in 1995 for its excimer laser system in correcting mild to moderate myopia. Other firsts for Summit include:

- First to offer excimer laser for PRK in U.S.
- First PRK patient treated 1989
- First astigmatic treatment 1992
- First hyperopia treatment 1993
- First FDA premarket approval for PRK excimer laser system 1995

(Summit homepage)

Summit leads the industry in laser sales. There are over 400 Summit excimer laser workstations in use worldwide.

Lens Express, wholly owned by Summit, provides a steady income from sales of contact lenses and related products. It also contributes a customer mailing list of four million potential surgical candidates. An estimated 70% to 80% of contact lens wearers have expressed an interest in laser refractive surgery. (Singer)

Summit Vision Centers are a highly visible and effective means of advertising as well as a profit center. The centers contribute to Summit's brand recognition. Summit,

together with newly acquired Autonomous Technologies, holds about forty technology and procedure patents necessary for the manufacture and operation of the excimer laser. The Autonomous acquisition secures for Summit several advanced technologies designed to produce customized ablations:

- The LADARVision System uses small spot scanning and eye tracking technologies to eliminate errors from eye movement.
- The "T-LASIK" incorporates eye-tracking technology into the LASIK procedure.
- Custom Cornea™ is an advanced eye measurement technology that generates custom ablation patterns.

Lastly, with the Krumeich-Barraquer acquisition, Summit obtained the patents for their computer-controlled microkeratome.

PILLAR POINT PARTNERS (PPP)

In 1992 VisX and Summit established Pillar Point Partners (PPP) as a patent holding company. Each of the companies held patents on technologies that could be profitably deployed in conjunction with technologies owned by the other company. Each company wanted to use technologies patented by the other company. This required that each company license the other company to use certain of its technologies. PPP was formed to administer these cross-licensing and patent issues between VisX and Summit. It also licensed the VisX and Summit laser technologies to competing equipment manufacturers and collected royalties from service delivery providers on each procedure performed. The royalty was divided between VisX and Summit, proportional to their contribution to the patent pool. VisX got 56% and Summit got 44%. (Muller, Burton)

It was never a happy union. Acrimonious legal disputes between the partners became the mainstay of PPP's existence. Early in 1998, Summit petitioned for dissolution of the partnership, and the Federal Trade Commission (FTC) filed a complaint against PPP claiming that the existence of PPP violated fair trade practices that resulted in overcharging consumers $30 million dollars in 1997. The FTC sought to deprive VisX of several patents under the pretext that they were obtained fraudulently.