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Sapphire Shop

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ABSTRACT

The sapphire shop business is an extension of John Tollison's lifelong avocation towards gemstones in general and sapphires in particular. It is a blend of both decisions concerning the expanding financial strains of the business, with two alternative sources of funds to be analyzed and evaluated, and personal household decisions concerning the entrepreneur's family. Either financial source will expand the firm's ability to purchase additional inventory of gemstones, a key component to growth in sales, profits, and cash flows. However, there are limits to Mr. Tollison's ability to continue these growth initiatives "without giving up his day job." If this decision is made in the affirmative, his household income stream will be reduced, just a few years before college costs will need to be met.

INTRODUCTION

> "You have been operating the Sapphire Shop from your basement for more than five years now. Why don't you give up your 'day job' and really turn it into a business? I'll bet you could do it now and I'd like to be your partner."

It was the spring of 2004. Tom had just expressed an opinion that he had been harboring for months to his friend and co-worker, John Tollison. Both men were currently employed for an electric utility in New York State. The electricity deregulation movement was affecting the industry and talk of layoffs had surfaced frequently over the last few years. Some of their colleagues had already left the company and others were updating their resumes.

Tom asked John, "How many years have you been with this company? I'll bet you could even get some retirement benefits."

It was true. John had been employed at this plant for 21 years, ever since he got out of the Navy. He was married with three children and his wife was a registered nurse employed in an administration position at a medical center a few miles from their home. Through their employers they had a solid middle class salary (approximately $70,000 each) and a full compliment of benefits (retirement, medical, dental, etc.). They lived quite comfortably in a four-bedroom colonial whose value had appreciated significantly in the last 10 years and whose mortgage payments were quite manageable.

John responded to Tom as he had at least a few times in the past. "Yes, but putting a couple of gemstones up for sale on eBay is a lot different than trying to make a living selling them!"

John had given a lot of thought to the idea of running his business on a full time basis. And over the last few years, he had been selling more than "a couple of stones" per year.

John's interest in gemstones had started when he was only eight years old. Not the jewelry element of gemstones, but just the stones themselves. His interest first began in Cub Scouts when he did a geology project. It continued in his Boy Scout years when he actually bought and sold semi-precious stones at hobby shops and gem shows. He even arranged a presentation of geological formations that were likely to yield gemstones on his way to Eagle Scout. And on one summer vacation, he persuaded his parents to stop at a site for mining sapphires in Montana. This visit really solidified his interest in and appreciation of sapphires for their beauty and ultimately their value to investors, collectors, and consumers of jewelry.

CHARACTERISTICS OF SAPPHIRES

Sapphires are a variety of the mineral conundrum and are the hardest gemstone after diamonds. They are most widely known as a blue precious gem, but they actually occur nationally in a number of other colors – pink, orange, green, yellow, and even with no color at all. The red stone in the conundrum is called a ruby.

The most prized and valuable natural sapphires came from mines in the small village of Sumjam in the Kudi village in the Northern India region of Kashmir. Discovered around 1880 after land slides revealed the valley's treasure, Kashmir sapphires quickly found fame. Exhibiting intensely captivating colors; their reign at the top was short–lived. Intensive commercial mining lasted only 30 years, before it was determined that the most economically attractive sites were depleted.

Independent miners still seek these stones because Kashmir sapphires were considered to be the most prized and valuable due to their depth of intense blue color. These gemstones have been bought and sold many times over the years, thus making it quite difficult to purchase and resell them with more than a small profit margin. Naturally, if one is unwilling to hold these stones in inventory for a number of years, the chance of an enhanced profit margin grows, along with the cost of financing this inventory and the risks of any short-term weaknesses in prices when a decision to sell is being made. Speculation as to future gemstone values and the costs of financing and insuring the inventory constitute an uncertain element of this business.[(1)]

For collectors of gemstones, as well as consumers of the more valuable sapphires, the highest quality stones were sourced in recent years from Sri Lanka (formally Ceylon) as well as Burma (now Myanmar) The world's largest exporter of sapphires currently is Thailand, with Africa, Australia, and even the United States having commercial deposits of conundrum in various colors and shades.

Retail Market for Jewelry, Watches, Precious Stones & Precious Metals [(2)]

There were approximately 49,540 establishments engaged in the retail sale of jewelry in the United States in 2003, Annual sales reached $26.9 billion. Stores selling only jewelry totaled 32,704 establishments, with sales of $13.8 billion. More diversified outlets selling jewelry as well as precious stones and precious metals totaled 14,363 stores, generating $12.4 billion in sales.

The retail fine jewelry industry was divided into two types of enterprises; chain stores and independents. In the early 1990s a slower growing economy resulted in poor sales and a number of actual bankruptcies. By mid-decade sales were rebounding and by the end of decade sales of fine jewelry and watches exceeded $52 billion. A strong economy with low unemployment contributed to strength in the luxury goods industry, which includes jewelry. The overall jewelry industry is cyclical in nature, although the luxury segment had experienced sustained strength throughout the 2000 to 2003 period.

For the retail segment, 1999 proved to be a stellar year for watches and related products. Strength in watch sales had been rising due in part to the influence of fashion designers who, in the late 1990s made watches a status symbol. Technology also fueled sales, with the advent of watches that connect to the Internet.

The independent jewelry retail business had fought a tough battle to maintain its identity in the competitive jewelry business of the last five years. One tactic that had proven successful was the introduction of in-house credit cards, engineered by retailers and their banks. Such lines of credit boosted sales and created customer loyalty by providing customers with lower borrowing costs and better terms.

Specialty jewelry sales were highly seasonal, with 25 percent of purchases being made in December over the last few years. This segment of the market totaled sales of $26 billion in 2003. Diamond jewelry made up 50 percent of these sales in recent years. The average consumer spent $500 per year on fine jewelry. The $52 billion sales level in 2002 was projected to grow to almost $62 billion in 2007, a rate of just under 4 percent per year.

Jewelers estimated that 30 to 50 percent of their revenues were related to the bridal business. Holidays and gift-giving opportunities were also major factors in sales of watches and jewelry. Year-round spending and the growth of purchases among women of jewelry for themselves reduced the seasonal importance of December sales, despite cyclical sales patterns related to economic activity and, to a lesser degree, seasonal demand.

Jewelry sales also depended heavily on fashion trends. Colored gemstones; designs from nature; diamonds in virtually any shape, color or size; yellow gold; white metals (platinum); princess-cut gemstones; pearls; and invisible necklaces had been quite popular in recent years.

Mass merchandisers had entered the retail industry in the last two decades. It was estimated that they currently accounted for 25 percent of the jewelry and watch market segment. Led by Wal-Mart, Target, and a number of department stores, they had been and were expected to continue to be a growing force in the industry.

Among the chain stores that specialize in retail jewelry sales, the leaders were long-time firms such as Zales (the domestic specialty retailer), as well as Sterling Inc., Whitehall Jewelers, Piercing Pagoda, and Tiffany and Company. After emerging from bankruptcy in 1993, Zales, under the leadership of Mr. Robert DiNicola had grown to become the largest player in this industry segment, with recent annual sales levels exceeding $1.5 billion. With approximately 1500 stores in the United States and Canada, the firm operated under a variety of store brands and outlets; Zales outlets, Peoples Jewelers, Zales Jewelers, which carried lower priced items, Gordon's Jewelers, which carried mid-prices items plus regional fashion jewelry, and Bailey Banks & Biddle, which carried upscale product lines. In a *Fortune* article, Amy Feldman wrote that a strategy of the firm was to "make Zales the McDonald's of the jewelry business, with national ads and standardized goods." In the mid 1990s their nationwide advertising incorporated a toll-

free number in newspaper inserts, television commercials, and direct mail catalogs. In late 1996 they expanded into the mail order catalog business and by 1999 they were selling merchandise direct on their own website at www.zales.com.

E- COMMERCE MARKET SEGMENT [3]

As retail jewelers entered the twenty-first century, they faced heavy competition from mass merchants, such as home shopping channels, mail-order firms, and discounters. If this did not provide them with enough challenges to their sales activities, the Internet had been generating yet another competitive threat. From approximately 1 percent of industry sales in 1999, projections of exponential growth for this new segment of the market extend for literally decades. Jewelers would have to get online to be competitive and this trend will continue for years. In fact a Merrill Lynch study estimated that, by 2005, one-quarter of the world's annual gemstone sales of $16 billion would be conducted online, compared to only 2 percent as recently as 2001.[4] An organization named Polygon Network, Inc. already maintained web sites for approximately 3000 retailers and suppliers on six continents as well as providing online information resources.

WORLDWIDE GEMSTONE MARKET [5]

The gemstone industry worldwide had two different sectors: diamond mining and marketing and the production and sale of colored gemstones. Most diamond supplies were controlled by a few major mining companies. Prices were supported by managing the quantity and quality of the gemstones relative to demand, a function performed by De Beers Consolidated Mines Ltd. This firm mined approximately one-half of all the diamonds produced each year and sorted and valued about two-thirds (by value) of the world's annual supply of rough diamonds. This was accomplished through the operations of the De Beers controlled Diamond Trading Company (DTC), which also had marketing arrangements with other diamond producers.

Production of gemstone diamonds continued to be led by long-time producing regions in Africa, namely Botswana, South Africa, Congo, and Angola, as well as Russia and Australia. Newer mining activity in Canada expanded significantly in 2003, placing them as the fourth largest producer in that year (Exhibit 1). In the industrial diamond market segment, the largest producers for years had been Congo (Kinshasa) followed by Australia, Russia, South Africa, and Botswana.

Perhaps the most significant developments on the supply side of the diamond markets were taking place in Canada. Two major diamond mines had been opened since 1999, resulting in a rapidly growing output of gemstone quality diamonds. The Ekati Diamond mine (estimated reserves of 54.3 million carats) was first to open in the Northwest Territories in 1999, followed by the Diavik Diamond Mine in 2002, with estimated reserves of 107 millions carats. The Snap Lake diamond project, with an estimated 38.8 million carats, is scheduled to begin production by 2007.

Worldwide production of natural gemstones other than diamonds was estimated to have exceeded $2 billion per year since the late 1990s. Most non-diamond gemstone mines are small, low cost, and widely dispersed operations in remote regions of developing nations. These colored gemstone producers were continuing their recovery from the weakened markets created by the Asian economic crisis of 1997-1998, where mining and sales were disrupted in many nations, particularly in Southeastern Asia. Prices of higher quality colored gemstones did not decline dramatically at that time, although weakness in less quality stones was observed in many markets. (6)

UNITED STATES GEMSTONE MARKET (7)

While the U.S. accounted for less than 1 percent of total global gemstone production, it was the world's leading gemstone market. On the basis of trade data and income growth rates, U.S. gemstone markets has been bolstered by strong demand among consumers with rising discretionary income and household wealth. The result has been that for at least the last six years approximately 35 percent of world gemstone demand originated in the U.S.

The largest segment of this market, measured by both volume and value was that of diamonds. Exhibits 2 and 3 present these data for the last five years. Of three segments of the diamond market, the largest in terms of value was "cut but unset natural diamonds larger than 0.5 carats." While second in terms of value of imports for consumption it was the only diamond market segment showing consistent growth, from 4.23 millions carats in 1999 to 5.76 million carats in 2003. In value terms, the growth was even greater, from $6.32 billion in 1999 to $9.46 billion in 2003.

The non-diamond segment of the gemstone marketplace has had a somewhat different performance over the last five years. Volume of the three major colored gemstones, emerald, ruby, and sapphire, had been quite volatile in the period. Emerald imports from Columbia in 2000 were a major contributor to that volatility. Sapphires had seen a more steady performance in terms of volume (Exhibit 2), with somewhat more positive growth in values over the period (Exhibit 3). However, the domestic market for all colored gemstones actually declined from $722 million in 1999 to $670 million in 2003.

In addition to jewelry, gemstones were also used for collections, exhibits, and decorative art objects. According to a poll conducted by a U.S. jewelry retailers association in the middle 1990s, almost two-thirds of domestic consumers who were surveyed preferred diamonds as their favorite gemstone. In descending order of their next favorite stones were emerald, sapphire, and ruby. (8) A more recent study, completed in 2001, showed a change in consumer preference. Blue sapphires moved into the top position, followed by rubies and emeralds. (9)

GEMSTONE PRICES

Using data from Exhibits 2 and 3, average prices for gemstones show interesting trends and levels. The highest average prices are seen in the "cut but unset natural diamonds

greater than 0.5 carats." From $1,494 per carat in 1999, they rose fairly steadily to $1,642 in 2003. The overall diamond category also grew from $423 per carat in 1999 to $623 in 2003 (Exhibit 4).

For colored gemstones, price volatility was quite a bit higher, while average prices per carat were significantly lower. Emeralds were the most volatile, especially influenced by the large volume of relatively cheaper stones in 2000. Yet by 2003, they sold for more than double the price of either rubies or sapphires. In fact, sapphires, which were rising in average price through 2002, saw a significant decline of more than 17.5 percent in 2003.

THE SAPPHIRE MARKET

Sapphires make up the second largest segment of the market for diamonds and colored gemstones in the United States. According to data from the U.S. Census Bureau published in the annual U.S. Geologic Survey report entitled "Gemstones," sapphires accounted for approximately 22 percent of U.S. imports for consumption in 2003, up from 16.9 percent in 2002 (Exhibit 2). In terms of value, the comparable figures for those years are 1.0 percent and 1.1 percent, respectively (Exhibit 3).

Data in Exhibit 5 show the sources of these sapphire imports and it is clear that in recent years Thailand has been "king of the hill." In 2003, 74.8 percent of sapphires by weight came from Thailand, with India in a distant second place at 14.3 percent.

In terms of value, Thailand was still in first place in 2003, with 53.7 percent of the market (Exhibit 6). Sri Lanka, at 22.1 percent, was in second place. The difference in positions of these countries when comparing weight of stones and value reflects the size and composition of imports. Average size and value for gems from Sri Lanka are higher than the stones from India or Thailand.

Interestingly, although the United States accounted for less than 1 percent of total global gemstone production, it was the world's leading gemstone market (Exhibit 7). It was estimated that approximately one-third of gemstone demand in recent years was centered in the United States, with Japan and Western Europe in second and third place. With growing wealth in certain countries bordering the Persian Gulf in the Middle East, demand for the highest quality stones has increased in recent years, though total consumption still lags behind the above-mentioned nations.

The colored gemstone industry was highly fragmented at all levels of exploration, mining, faceting, polishing, and distribution. No single operating entity controlled 2 percent of the market, measured by volume or value of shipments. This is quite different from the much larger diamond market where DeBeer's was estimated to control approximately 40 percent of production, down from almost 75 percent 20 years ago, as new discoveries in Canada, Australia, and Russia diluted their primarily African sources of supply.

Multiple trade layers could result in an escalation of the final consumer price paid for sapphires and other colored gemstones. Unlike the diamond market, which is driven by demand forces, the colored gemstone industry was supply driven.

There was no sustained branding or marketing of colored gemstones, although a few firms were making efforts in that direction. Businesses were established primarily with a non-corporate structure, typically operated by entrepreneurs with an interest in gems, but with limited business expertise. A successful sapphire dealer was someone able to effectively and efficiently interpret the highly subjective nature of the marketplace. Pricing and demand could fluctuate dramatically in short periods of time, in response to events affecting consumer tastes and preferences as well as consumer well-being and attitudes towards the purchase of luxury goods (i.e., fine jewelry) for consumption and/or investment.

John had seen this volatility first hand over his years in the business. A dazzling "fire-engine-red" 10-carat Burmese ruby could sell for $1 million, while a rose-colored one-carat sister gemstone could be purchased for $1,000. A navy-blue one-carat Ceylon sapphire could sell for $2,000 in Taiwan or Korea, while the same stone would be worth only $1,000 in Italy or England, simply because jewelers preferred lighter shades.[(10)]

In order to compete successfully in the colored gemstone marketplace in general and the growing segment of Internet retailers in particular, detailed images of specific stones had to be prepared for and sent to potential online customers. John always believed that the images on his website were of high quality and therefore provided him with a significant advantage over most of his competitors. To maintain that quality he produced all of the digital images in his office, thus requiring him to carry a relatively large inventory position. He believed that his main competitor was Thaigem.com, a market leader in the sale of gemstones. They were known to carry an inventory of over one million gemstones, with every one of them available for inspection by potential buyers on their website.

THE THAIGEM.COM STORY [(11)]

Thaigem.com was the e-commerce arm of Thaigem Global Marketing Limited. Its sister company, the NCS Group Co. Ltd., (formally known as Numtiya Care Stone Co. Ltd.) was a traditional gemstone wholesaler based in Chanthaburi, Thailand. Thaigem.com used the Internet not only as another form of advertising but also as a medium to conduct business and generate profits.

This region of Thailand developed around mining operations that produced rubies and sapphires. When the supply of local stones diminished, the local industry continued its processing activities by developing alternative supply networks for rough gems. Established in the early 1980s, NCS Group built its reputation as an exporter of colored gemstones from this regional industry hub.

In 1998 NCS Group launched its experiment in online sales and profitable operations were achieved almost immediately. Rapid growth in revenues began with only five items being listed on eBay. By the end of its first year, thousands of gemstones were listed online and Thaigem.com was born as the web's Biggest Gem and Jewelry store.

Expansions of operations continued each year and, by the end of 2002 Thaigem.com achieved worldwide marketing activities, buying directly from its sister company, the NCS Group, to fulfill orders. With approximately 300 employees, NCS Group was the largest single private sector employer in the Chanthaburi province of Thailand. Sales had grown from $12 million in 2000 to almost $50 million in 2001 and $70 million in 2002. With shipments of almost 2,000 items daily and an average return rate of only 3 percent, Thaigem.com was among the most profitable e-businesses in Asia and the undisputed e-commerce leader in Thailand.

Thaigem.com catered to the diverse range of global tastes and performance at extremely competitive prices. With a listing of more than one million individual items online, the firm sourced gems from 60 countries, stocking more than 400 gem types. Its high volume operations enable bulk inventory acquisitions at very competitive price levels. Sales were then made to most customers as single items or small lots. It was estimated that Thaigem.com enjoyed a market share approaching 90 percent, which allowed them to rapidly diversify into related areas such as jewelry, carvings, beads, tools etc.

All the trading options available on Thaigem.com were accessible to the general public. This policy was not aimed at putting competitors out of business nor reducing the profitability of existing resellers but was made in consideration of some key characteristics of the colored gemstones and jewelry industry. For example the traditional structure of the industry was known as the seven-tier supply chain. Between the mine and the consumer, these tiers resulted in price increases of 1000 percent. A key goal of Thaigem.com was to break down the artificially fixed prices that had become entrenched within the industry's distribution channels. The fact that amateur collectors, traders, and consumers could now go online and purchase quality gems and jewelry at significantly reduced prices contributed to the growth and reputation of the entire gem industry.

SAPPHIRE SHOP OPERATIONS

Sapphire Shop began operations in August of 1998 as an e-commerce/retail business venture. It grew out of the hobby and avocation of Mr. John Tollison, who had more than a passing interest in gemstones for almost his entire life. The business specialized in the sale of loose, natural colored gemstones primarily through its website. Sapphire Shop differentiated itself from its competitors by specializing in providing generally higher quality, higher priced stones with a commensurate higher standard of customer service.

After a few years of operations, John was once again talking to his co-worker Tom about the company. "We compete with a broad variety of market participants. In our market segment Thaigem.com is the Wal-Mart of the business. They turn a modest 3 percent profit on sales, but they have high volume. We're looking at 14 to 15 percent margins,

with sales increases on the order of 20 percent for fiscal year 2003. That is what selling high quality stones gets you." John continued, "if I can maintain my growth and build up my inventory, I think I could have enough high quality sapphires and enough cash to start buying and operating other websites. I'll sell my sapphires to their customers."

SAPPHIRE SHOP FINANCIAL HISTORY

While Mr. Tollison sounded quite confident in the summer of 2003, his earlier assessment of the future of this business was correct –"making a living selling gemstones would take some practice." Exhibit 8 presents income data for the firm's operations since its first full year -- 1999. While net sales growth was substantial in the early years, the economic uncertainties of 2001 and 2002 reduced top line performance, while net income actually declined substantially in 2002. Performance in 1999 proved to be quite an experience, as John quickly learned that purchasing gemstones from other collectors on eBay drove up his cost of goods sold. In addition, the initial euphoria of trips to gem shows in Las Vegas and Tucson, Arizona, "on the company," contributed significantly to a loss of over $25,000 for that year. However, while in Tucson, John met the owner of a small, family-owned Australian sapphire mine and they struck a deal. The result was a new source of supply at lower cost and a significant reduction in cost of goods sold for fiscal year 2000 and beyond. "Sales are great, but I'm investing every penny I have to keep up with what I think I'll need for inventory each yea."

In fiscal 2000, John invested $50,000 in the business by purchasing additional shares at $5.00 each. The source of the money was a home equity loan on his house. When another $50,000 was needed for inventory in 2001, the Home Equity Line of Credit (HELOC) was increased and he "loaned" the money to the business in the form of a 10-year note. The interest rate paid by the company varied with the interest rate charged by his bank on the home equity loan. Smaller amounts were invested in the business for shorter periods of time and are found in the notes payable item on the balance sheet (see Exhibit 9). In addition to these funds, all retained earnings generated since the first profitable year of 2000 were plowed back into the business.

In 2002, at the insistence of his wife, Alexis, John agreed to start taking a small "salary" from operations. Included in SG & A that year was an expense of $8,000, which increased to $10,000 in 2003. While this was not a realistic estimate of compensation for his efforts on behalf of the firm, it was a start. When thinking about operating the business on a full time basis, that expense would have to grow substantially.

By year end 2002, John had just under $132,000 invested in the firm in the form of equity and debt. By year end 2003, it was up to just over $200,000! From an initial investment of $1,000 in 1998, this financing pressure was being felt in the entire Tollison household.

THE OPTIONS

Just after midnight on New Year's Eve, 2003, one of Mr. Tollison's best customers made a financial proposal to John, "I will tell you how to keep up with that growth in your firm,

let me invest!" Neal Roberts was a trader on Wall Street and had always been interested in John's operations. That night he made the following offer, "Look," said Neal, "the way I see it, you need about $200,000 and I need somewhere to put my money. Why not let me invest in the company? We will be partners." Mr. Roberts continued, "You can run the company and I will give you $200,000 next week. At the end of the year we will split up the profits. With your 20 percent annual earnings growth, that should be plenty."

The next Monday at work, Tom and John were eating lunch and John was discussing Neal Roberts offer. "You know Tom, it sounds like a pretty good deal. I have $200,000 invested in the company and this guy wants to give me $200,000. He proposed that since I am running the company, I will get 50 percent of the firm and he will take 50 percent. I guess he deserves it if he is matching my investment dollar for dollar."

Tom proposed a question, "Those dollars will surely allow you to purchase larger quantities of stones, but what if you don't sell them all by year end? Does he want his money back plus profits? How would you repay him if the funds are still in your inventory?" "I won't have to repay him" said John. "He will own one-half of the company. Maybe I better not rush into this. But his funds would allow me to keep my job here at the plant. So I would not have to charge the business a full salary, as Alexis has suggested."

That evening John picked up the mail and took a number of checks to his bank for deposit. He noticed an advertisement for small business loans, so he decided to talk to a loan officer. "Just based on current sales and expenses, and if you are willing to put your inventory up as collateral, we could give you a term loan in the neighborhood of $100,000. We will need your last three years of financial statements to verify your loan application. Get me that information and I'll fax you our specific guidelines and offer."

Two days later, the fax was waiting for John in his basement office when he arrived from work (Exhibit 10). After reviewing the details, he called Alexis, "Honey, last week I couldn't find a dime to buy more inventory and now I have two sources of funds, at very different costs and terms. What am I supposed to do?"

In February of 2004, after the books were closed for 2003 and all his tax returns were filed, Tom and Alexis decided to take a short weekend trip, without the children, to assess their current life and plans for the next five years, John's "day job" plus hours spent on Sapphire Shop activities left very little "family time" and Alexis had some strong feelings about where their life together was going. College tuitions would start in four years and extend out at least eight more years. If the business continued to require funding and if John decided to "retire" from his day job, how were the bills going to get paid?

Alexis took the position that if the business could at least allow John to make no more "investments" into it and he could not take out at least his salary and benefits package, worth approximately $76,000 annually and expected to grow by 4 percent per year, then he should give up the business.

John and Alexis drove up to a Bed and Breakfast situated on the coast, just north of Portland, Maine. Even though it was still winter, they could walk along the beach, hike in the woods and enjoy good meals and after dinner a "fireside chat." They had agreed that a strategic family plan would be "approved" by the end of the weekend.

JOHN'S FINAL CHALLENGE

The early months of the year were a slow season for gemstone sales. John had two specific proposals for expanding his operations, along with a decision on whether or not to turn his gemstone business into a full-time operation. Meeting his wife's criteria of requiring the business to replace his current full-time compensation package would not be feasible in the next five years. However, since he would qualify for a pension of $37,000 upon retiring from his current job, he would need $39,000 in salary from Sapphire Shop to meet Alexis' desires. He had already budgeted an increase in "salary" of $16,000 for fiscal 2004 operations. The gap would require a significant increase in operating cash flows to achieve his goal.

In planning for the future performance of Sapphire Shop, John was considering three potential growth strategies, based on his experience and discussions with participants at trade shows and suppliers. Depending on his aggressiveness with respect to advertising and marketing plans, he could generate top line growth of 10, 20, or 30 percent for the next five years. While cost of goods sold might create some operating efficiencies as sales accelerated, S G & A and inventory would have to expand significantly, creating financial pressure and increased funding requirements. And, since inventory had to be purchased before being sold, the risks of a slowdown in demand were always a possibility.

Another risk was an actual decline in his sales, especially if he decided to give up his "day job" and operate Sapphire Shop on a full time basis. How would this alternative affect not only the business, but also his family responsibilities?

END NOTES

1) "Sapphire Buyer's Guide" Thaigem.com for Sapphires, Beads and Sapphire Jewelry."

2) "Jewelry Stones," *Encyclopedia of American Institute*, Online Edition, Gale, 2004.

3) Ibid.

4) "Thailand's Godfather of Gems," *Big Chilli*, May 2002.

5) Olson, Donald W., "Gemstones," *U.S. Geological Survey Minerals Yearbook*, Annually, 1998-2003.

6) Cavey, Christopher, "Other Gemstones,, *Mining Journal*, annual preview Supplement vol. 330, no. 8481, May 22, 1998: 19.

7) Ibid.

8) "New Survey Measure U.S. Jewelry Market" *ICA Gazette*, August 1996:1.

9) Prost, M.A., "Retail Customers Consume The Classics," *Colored Stone Magazine* 14, no.1, January-February, 2001: 491-521.

10) "Thailand's Godfather of Gem," *Big Chilli*, May 2002.

11) "The Thaigem.com Story," Thaigem.com.

12) Tollison interview with Thaigem.com company source, Tucson, Arizona, 2003 Gem show, February 2003.

EXHIBITS

Exhibit 1

Estimated World Production of Natural Diamonds, by Type
(in thousands of carats)

Year	Gemstones	Industrial	Total
2003	80,900	69,500	150,000
2002	70,600	63,500	134,000
2001	64,500	56,100	121,000
2000	61,200	55,300	117,000
1999	60,600	57,600	118,000
1998	60,800	69,300	130,000
1997	57,600	65,100	123,000
1996	55,200	66,200	121,000
1995	55,700	60,100	116,000

Notes: (1) World totals and estimates data are rounded to no more than three significant digits; may not add to totals shown.

Source: "Gemstones" by Donald W. Olson, U.S. Geological Survey Minerals Yearbook 2003, 1999.

Exhibit 2

U.S. Imports for Consumption of Diamonds and Colored Gemstones, by Kind
(Quantity in Carats)

Type of Stones	2003	2002	2001	2000	1999
Rough or uncut, natural Diamonds	1,500,000	1,010,000	900,000	2,280,000	4,270,000
Cut but unset, less than 0.5 carat natural Diamonds	13,400,000	14,300,000	11,500,000	14,500,000	14,900,000
Cut but unset, more than 0.5 carat natural Diamonds	5,760,000	5,690,000	4,710,000	5,040,000	4,230,000
Total Diamonds	**20,660,000**	**21,000,000**	**17,110,000**	**21,820,000**	**23,400,000**
Emerald	3,020,000	8,670,000	6,370,000	22,100,000	5,040,000
Ruby	4,550,000	3,660,000	3,000,000	4,500,000	4,080,000
Sapphire	8,040,000	6,780,000	6,150,000	8,400,000	7,160,000
Other	N/A	N/A	N/A	N/A	N/A
Total Non- Diamonds	**15,610,000**	**19,110,000**	**15,520,000**	**35,000,000**	**16,280,000**
Total Gemstones	**36,270,000**	**40,110,000**	**32,630,000**	**56,820,000**	**39,680,000**

Source: "Gemstones" by Donald W. Olson, U.S. Geological Survey Minerals Yearbook Various Years, Tables 8.

Exhibit 3

U.S. Imports for Consumption of Diamonds and Colored Gemstones, by Kind
(Value in Millions)

Type of Stone	2003	2002	2001	2000	1999
Rough or uncut, natural Diamonds	$707	$567	$550	$741	$734
Cut but unset, less than 0.5 carat natural Diamonds	2,710	2,710	2,410	3,120	2,840
Cut but unset, more than 0.5 carat natural Diamonds	9,460	8,800	7,630	8,140	6,320
Total Diamonds	**$12,877**	**$12,077**	**$10,590**	**$12,001**	**$9,894**
Emerald	$126	$143	$141	$176	$183
Ruby	87	88	69	85	110
Sapphire	136	139	122	156	129
Other(rough cut)	40	41	38	56	57
Other(cut,set & unset)	281	265	268	294	243
Total Non- Diamonds	**$670**	**$676**	**$638**	**$767**	**$722**
Total Gemstones	**$13,547**	**$12,753**	**$11,228**	**$12,768**	**$10,616**

Source: "Gemstones" by Donald W. Olson, U.S. Geological Survey Minerals Yearbook Various Years, Table 8.

Exhibit 4

Average Price of U.S. Imports for Consumption of Diamonds and Colored Gemstones, by Kind
(In U.S. dollars)

Type of Stone	2003	2002	2001	2000	1999
Rough or uncut, natural Diamonds	$471	$561	$611	$325	$172
Cut but unset, less than 0.5 carat natural Diamonds	202	190	210	215	191
Cut but unset, more than 0.5 carat natural Diamonds	1,642	1,547	1,620	1,615	1,494
Average Diamond Price	**$623**	**$575**	**$619**	**$550**	**$423**
Emerald	$41.7	$16.5	$22.1	$8.0	$36.3
Ruby	19.1	24.0	23.0	18.9	27.0
Sapphire	16.9	20.5	19.8	18.6	18.0
Other	n/a	n/a	n/a	n/a	n/a

Source: Data in Exhibits 2 and 3

Exhibit 5

U.S. Imports for Consumption of Sapphire By Kind and Country
(Quantities in Carats)

Country	2003	2002	2001	2000	1999	1998
Australia	5,080	82,700	3,270	7,320	8,540	37,000
Belgium	10,400	8,440	1,720	3,000	12,500	29,000
Brazil	1,040	1,250	642	6,590	6,920	5,770
Burma	23,200	669	395	8,720	1,830	824
Canada	4,350	664	250	699	44	283
China	12,500	28,800	15,100	30,000	15,200	6,700
Columbia	248		3,680	43,100	2,110	2,400
France	18,700	1,710	1,670	1,740	815	250
Germany	35,800	143,000	42,500	53,700	143,000	59,900
Hong Kong	234,000	251,000	281,000	326,000	301,000	244,000
India	1,150,000	828,000	873,000	1,160,000	862,000	757,000
Israel	26,500	26,700	40,700	63,100	100,000	96,300
Japan				105,000	16,300	3,550
Singapore				147	285	2,270
Sri Lanka	314,000	274,000	294,000	492,000	480,000	346,000
Switzerland	75,100	31,600	36,900	50,400	38,600	137,000
Tanzania				238	822	7,030
Thailand	6,010,000	5,040,000	4,470,000	6,000,000	5,080,000	4,900,000
United Kingdom	21,800	32,700	17,500	13,800	14,100	23,400
Other	88,400	28,700	65,900	28,900	81,700	16,800
Total	**8,040,000**	**6,780,000**	**6,150,000**	**8,400,000**	**7,160,000**	**6,670,000**

Notes: Data are rounded to no more than three significant digits, may not add totals shown.

Exhibit 6

U.S. Imports for Consumption of Sapphires By Kind and Country [1]
(Value in Millions)[2]

Country	2003	2002	2001	2000	1999	1998
Australia	(3)	$1	(3)	$1	(3)	(3)
Belgium	$1	1	1	1	2	1
Brazil	(3)	(3)	(3)	(3)	(3)	(3)
Burma	1	4	1	2	2	1
Canada	(3)	(3)	(3)	1	(3)	(3)
China	(3)	(3)	(3)	(3)	(3)	(3)
Columbia	(3)	n/a	(3)	(3)	(3)	(3)
France	3	1	1	1	(3)	(3)
Germany	3	2	1	1	3	2
Hong Kong	6	7	8	11	9	6
India	5	4	5	4	3	4
Israel	3	2	3	5	6	2
Japan	n/a	n/a	n/a	1	(3)	(3)
Singapore	n/a	n/a	n/a	(3)	(3)	(3)
Sri Lanka	30	25	20	25	19	17
Switzerland	6	8	12	17	15	16
Tanzania	n/a	n/a	n/a	(3)	(3)	(3)
Thailand	73	77	66	81	64	66
United Kingdom	3	4	3	3	4	5
Other	2	3	2	4	2	3
Total	**$136**	**$139**	**$122**	**$156**	**$129**	**$123**

Notes:
(1) Data are rounded to no more than three significant digits, may not add totals shown
(2) Customs Value
(3) Less than 1/2 Unit
(4) n/a - not applicable

Source: Gemstones by Donald W. Olson, U.S. Geological Survey Minerals Yearbook, Various Years, Table 8.

Exhibit 7

Gemstones in the United States
(In Millions of Dollars)

Year	Production (natural)	Production(Synthetic)	Imports for Consumption	Exports Including Reexports	Appearent Cosumption
2003	$12.5	$33.4	$13,600	$5,490	$8,160
2002	12.6	18.1	12,900	4,880	8,050
2001	14.9	24.7	11,300	4,320	7,020
2000	17.2	57.1	12,900	4,330	8,640
1999	13.5	49.1	10,200	3,380	6,880
1998	14.3	24.2	9,250	2,980	6,310
1997	25.0	21.6	8,380	2,760	5,670
1996	43.6	24.0	7,240	2,660	4,650
1995	48.7	26.0	6,540	2,520	4,100
1994	50.5	22.2	6,440	2,240	4,270
1993	57.7	18.1	5,850	1,630	4,300
1992	66.2	18.9	4,950	1,450	3,480
1991	84.4	17.9	4,640	1,710	3,030

Source: U.S. Geological Survey Minerals Yearbook, Mineral Commodity Summaries'
Feb. 2000, Jan 2004
Prepared By Donald W. Olson
dolson@usgs.gov

Exhibit 8

Sapphire Shop, Inc.

Income Statements
(In Dollars)

	2003	2002	2001	2000	1999
Net Sales	$169,212	$132,482	$121,851	$109,259	$72,009
Cost of Goods Sold	53,928	48,738	40,617	33,843	67,378
Gross Margin	115,284	83,744	81,234	75,416	4,631
Selling, General & Administartive Expenses	46,524	44,722	35,472	40,547	24,584
Earnings Before Interest, Taxes & Depreciation (EBITDA)	68,760	39,022	45,762	34,869	-19,953
Depreciation & Amortization	1,800	1,500	0	0	0
Earnings Before Interest & Taxes (EBIT)	66,960	37,522	45,762	34,869	-19,953
Less :					
Net Interest Expense	9,671	9,386	7,683	6,851	5,393
Net Other Adjustments	1,246	1,471	4,650	997	0
Earnings Before Taxes (EBT)	56,043	26,665	33,429	27,021	-25,346
Taxes	22,417	10,666	13,372	10,808	0
Net Income After Taxes	33,626	15,999	20,057	16,213	-25,346
Net Income Applicable to Common Stockholder	33,626	15,999	20,057	16,213	-25,346

Exhibit 9

Sapphire Shop, Inc.

Balance - Sheet
(In Dollars)

	2003	2002	2001	2000	1999
Assets					
Cash	$5,832	$6,361	$6,123	$5,194	$6,428
Short term investments	1,000	1,200	0	0	0
Accounts receviables	5,139	4,840	3,521	2,562	414
Inventories	174,020	146,819	118,248	58,705	987
Total Current Assets	$185,991	$159,220	$127,892	$66,461	$7,829
Property, Plant & Equipments (net)	7,500	6,500	5,000	5,000	5,000
Total Assets	**$193,491**	**$165,720**	**$132,892**	**$71,461**	**$12,829**
Liablities & Equity					
Accounts payable	$28,942	$31,797	$21,968	$30,594	$37,175
Accrued expenses	2,000	2,000	0	0	0
Notes payable	2,000	5,000	0	0	0
Total Current Liablities	$32,942	$38,797	$21,968	$30,594	$37,175
Long term debt	50,000	50,000	50,000	0	0
Equity:					
Common stock ($1 Par Value)	5,000	5,000	5,000	5,000	100
Capital Surplus	45,000	45,000	45,000	45,000	900
Retained Earnings	60,549	26,923	10,924	-9,133	-25,346
Total Equity	110,549	76,923	60,924	40,867	-24,346
Total Liablities & Equity	**$193,491**	**$165,720**	**$132,892**	**$71,461**	**$12,829**

Exhibit 10

Summary of Loan Agreement for Bank Term Loan

Description of the Loan

Amount - $100,000

Rate – Prime Plus 2%, floating (adjustable semi annually)

Term – 5 years

Repayment – In full at the end of five years.

Prepayment – Permitted in whole or in part at any time, without penalty. All prepayments will be applied to the outstanding principal balance of the loan in inverse order of maturing segments.

Compensating Balances – Borrower must maintain average annual deposit balance equal to at least 10 percent of the outstanding principal amount of the loan.

Conditions Precedent

Prior to the making of this loan, as described above, the borrower must have satisfied the following terms and conditions;

Incorporation – Borrower must be a duly incorporated corporation authorized to undertake this borrowing and all other transactions associated with this borrowing.

Equity position – The equity account of the said corporation should exceed $50,000 for at least the most recent three year period.

Affirmative Covenants

During the life of this loan, borrower will adhere to the following terms and conditions;

Financial statements – Semi annual financial statements must be provided within 60 days of the end of June each year and 90 days at the end of the borrowers financial year (December). Audited financial statements bearing an unqualified opinion from an independent accounting firm must be provided 90 days after the end of the fiscal year.

Accounting Changes – Borrower will make no changes in its method of accounting.

Negative Covenants

During the life of this loan, borrower will not do any of the following without written consent of the lender;

Continuation of management – No changes in management, Aggregate compensation of Mr. Tollison will not be increased by more than 5 percent in any year, with present compensation levels to serve as the base for this computation.

Negative Pledge – No assets to be pledged or otherwise used as collateral for any indebtedness.

Sale of Assets – No sale of a substantial portion of the assets of the borrower. Borrower will not merge with or be acquired by any other entity.

Acquisitions – Borrower will not acquire any other entity.

Capital Expenditure – Not to exceed $ 20,000 in any one year.

Dividends – In any one year restricted to after tax profits minus all principal repayments on outstanding indebtedness.

Net Working Capital – Not to decline below $60,000

Additional Indebtedness – No additional debt (including leases) with a term exceeding one year unless subordinated to this loan. Any short term debt must be retired for a period of at least 30 consecutive days in every year.

Senior Debt – Senior debt, including all short –term indebtedness, may not exceed $150,000 plus all earnings retained in the business as of December 31, 2003.

Events of Default

In the event of the default, this loan plus accrued interest will become due immediately and payable.

The following will constitute events of default:

1) Failure to pay interest or principal when due.

2) Violation of any affirmative or negative covenant of this loan.

3) Bankruptcy, reorganization, receivership, liquidation.

4) Commission of an event or default on any other indebtedness.

Sapphires

Case Supplement

SAPPHIRES

From time immemorial, the allure of sapphires has made them one of the most popular of all the colored gemstones. In recent years, sapphires have remained the number one colored gemstone in the American marketplace. Their beauty and mystique continue to enchant buyers in markets around the world. While generally not as expensive as rubies, prices for fine quality large sapphires can actually exceed the price of diamonds. The highest price ever paid for a sapphire was $48,871 per carat for the Rockefeller Sapphire, a stone weighing 62.02 carats ($30,309,794).

As with all gemstones, quality equals value. Every stone is, to some extent, unique. Consequently, there are numerous attributes that must be taken into consideration when a value, and therefore a price, is placed on a particular stone.

The island of Serendib (present day Sri Lanka) holds one of the earliest records for the mining of sapphires. Ancient people believed that the power of wisdom was contained within this precious gemstone. They believed that when the wearer of a sapphire faced challenging obstacles, the stone's power enabled them to find the correct solution. The modern word sapphire is derived from the ancient Latin term "Sapphirus."

Sapphires are found in the full spectrum of colors, except for red. Generally when people refer to the word sapphire without a prefix, they are thinking of blue sapphires. Sapphires of all other colors are assigned a color prefix (e.g., pink sapphire, yellow sapphire, purple sapphire, etc.), or are collectively termed "Fancy Sapphires." Color change sapphires are not very well known, but can be quite magnificent and valuable when set into fine gold jewelry.

Similar to rubies, sapphires are found and available to the marketplace in many different shapes and sizes. They provide great variety to gemstone purchasers and contribute to the enduring popularity of sapphire jewelry. With hardness just below that of diamonds, sapphires are one of the toughest and most durable gemstones and, with no cleavage, breakage rarely occurs.

Blue Sapphires

Australia and Africa are the world's largest suppliers of "Blue Sapphires." Sri Lanka also provides a large portion of the world's supply of blue sapphires. Gemstones from this island are often called "Ceylon sapphires," as Ceylon was the name of the island before it was changed to Sri Lanka. Pailin, Cambodia is another source of exceptional quality blue sapphires, as well as Myanmar (Burma).

This enduring and most popular color hue of the sapphire family comes in a wide range of blue colors. With the exception of the rare and collectable padparadsha sapphires, blue sapphires are thought of as the most desirable and expensive of the entire sapphire family.

Graduating in color from light pastel blues all the way through to the depths of midnight blue, the most beautiful blue sapphire colors and those of highest value are found in the middle of the blue-color range. While the pale blues and darker midnight blues offer the purchaser the best

value for a given size and clarity stone, the rare and captivating cornflower blues offer unbeatable color with a captivating beauty – but at a premium price.

The most sought after color for blue sapphires is intense medium dark blue. Sri, Lanka, Cambodia, and Myanmar produce very fine blue sapphires, although Cambodian stones are sometimes slightly dark. Australian sapphires tend to have green overtones and concentric hexagonal bands. Midnight blue sapphires have traditionally seen lesser demand, but in recent years there has been a growing interest in these colors, particularly for earrings.

Intensity, uniformity, and purity of color are the most important characteristics of these gemstones and their price. Fine blue sapphires should not contain any overtones or secondary colors. The overall beauty and value of the stone will also depend on the quality of the cutting. Dark blue sapphires will appear black under low light settings, while fine blue sapphires will maintain their color in any light setting.

Padparadsha Sapphire

Sri Lanka is the most famous mining area for "Fancy Sapphires," as it is where the Padparadsha sapphire can be found. These gems combine three colors of pink, purple, and orange in one stone and resemble the famed and beautiful "lotus blossom" flower known to the native Ceylonese as "padparadsha." Their pink-orange to red-orange color is so rare and unique that these gemstones are highly prized and valued by collectors and connoisseurs. Color intensity is the most important factor contributing to the value of padparadsha sapphires. They should display intensity, uniformity, and purity of color. Careful cutting of these stones is another important valuation factor. These are the most expensive of all the fancy sapphires and prices can reach many thousands of dollars per carat. In recent years, padparadsha sapphire jewelry has also increased in popularity and demand.

Pink Sapphires

After the beautiful and seductive tones of padparadsha and blue sapphires, the next most highly valued member of the family is the pink sapphire. Ambiguously sharing a color border with rubies, many pink sapphires are so close to this boundary that they are sometimes termed "hot pink," with a commensurate premium price attached to them.

For those pink sapphires that remain firmly within the color realms of pink, buyers may choose a color range from good value pastel pink shades to the more expensive but vivacious colors approaching the hot pinks. Perennially, the fancy sapphire favorite, pink sapphires are often used in tandem with blue sapphires to accent diamonds, displaying bright, colorful yet harmonious contrasts within a single piece of jewelry (ring, pendent, earrings).

Yellow Sapphires

Yellow sapphires provide both beauty and value within the same gemstone. Colors range from pleasing butter to intensely beautiful yellow. Yellow sapphires are frequently found in large

crystal sizes that are surprisingly affordable and often offer the best value of the entire sapphire family. Major suppliers include Australia, Thailand, Sri Lanka and Tanzania.

Purple Sapphire

The best purple sapphires display rich purple-pink colors reminiscent of orchids. Often prized by collectors, they are also one of the most affordable gemstones for the value consumer.

Green Sapphires

These gems display a range of green hues from colors reminiscent of olives, through army uniforms all the way to wine-bottle-like green. Australia and Thailand are the sources of these stones, which generally are under appreciated in the marketplace resulting in the lowest price range of the sapphire family.

Star Sapphires

Star sapphires have exhibited a growing demand over the years due in part to their unique optical characteristics. Examining a star sapphire results one may see six- to twelve- rayed stars silently gliding across the gemstone's surface. With their very bright and lustrous star formations, star sapphires have been the most popular and valuable of all the star gemstones.

OTHER ASPECTS OF SAPPHIRES

In addition to sapphire color and country of origin, there are other characteristics of these gemstones that contribute to their value and price in markets around the world.

Carat Weight

Large supplies of high quality are rare and highly prized by collectors and consumers. Although not as valuable as rubies of comparable size, high quality stones above 15 carats are considered extremely rare. As the carat weight of a sapphire increases, so does
its price per carat. Since large sapphires are many times rarer than smaller sapphires, carat prices rise disproportionately – a five carat sapphire will cost many times more than five one carat sapphires of comparable color and quality.

Prices of sapphires as well as most other gemstones increase in a step-like fashion as carat weight rises. For example, a 3.04 carat gemstone commands a higher per carat price than that of a 2.98 carat gemstone, despite a near imperceptible difference in actual size and weight. This "non-linear scale of increments" in pricing is found in the valuation of most gemstones.

Freedom from Inclusions

The ideal sapphire should allow for the free, unencumbered transmission of light throughout the body of the stone without hindrance. The ideal stone would therefore be considered "crystal clear." In the case of sapphires, their clarity tends to be less than that found in many other

gemstones, especially when compared to diamonds. Therefore, their overall place on the gemstone valuation scale will be lower than these stones.

Shape and Cut

Faceted sapphires are those with flat, polished faces, which are available in a variety of shapes and styles. Ovals and cushion cuts are most common with other shapes such as emerald cut and heart shapes are also available.

Small premiums are found in the valuation of round cut sapphires due to the higher carat weight loss of expensive rough crystal during cutting. Conversely, discounts are often applied to the value of pear and marquise cuts, since losses can be reduced in their processing.

A perfectly cut sapphire should exhibit good symmetry and polish conditions. Facets should be aligned straight in relation to the gem's girdle and also to each other. Polish condition should result in no visible surface pits or polishing lines.

The most common form of cut seen in sapphires is known as cabochon. This is a simple style of cut where the stone has a flat bottom and a highly polished domed top. It is generally used to display colors and optical effects in opaque and translucent gemstones.

In the case of sapphires, it is used to develop and display asterism (the star effect) in star sapphires. Cabochon cuts are most commonly applied to those sapphires whose clarity is not ideal for faceting. Well-cut proportional cabochons with good symmetry that are also semi-transparent with smooth un-cracked domes are the most highly valued stones in this category.

CLASSICAL AND MODERN SOURCES OF SAPPHIRES

The classical sources of quality sapphires throughout history have been the Mogok Stone Tract in Myanmar (Burma) and the gem fields of Sri Lanka. So synonymous are these locals with fine sapphires that some buyers are prepared to pay a premium for Burmese and Ceylon sapphires over those sourced in other areas. Frequently noted for their cornflower blues, sapphires from a Burmese province are thought to be of slightly higher quality and therefore somewhat more desirable (and valuable) than those from Sri Lanka.

However, an historical blip occurred in the quality sapphire market that temporarily resulted in a repositioning of Burmese and Ceylon sapphires to second and third place. The newly crowned number one was the Kudi Valley in Kashmir, India. Discovered in 1880 after landslides revealed the valley's treasures, Kashmir sapphires quickly achieved fame in the marketplace. These gemstones exhibited intensely captivating colors, but their reign at the top was short-lived. Mining activity lasted only 30 years, with commercial production stopping more than half a century ago. It is almost impossible to find Kashmir sapphires in today's market. Known specimens are jealously guarded by private collectors as well as by some museums that own them.

With Kashmir sapphires all but non-existent, Burmese and Ceylon sapphires now command the top prices, with gem connoisseurs keenly vying for their beauty and pedigree. Putting history and pedigree aside, sapphires every bit as beautiful have been found in many other areas of the world; Australia, Cambodia, Kenya, Madagascar, Tanzania, Thailand, and Vietnam. In fact, in recent years, Madagascar's prolific Ilakaka gem fields account for approximately 20 percent of total global sapphire production.

The Use of Heat

Most sapphires seen on the market in recent years have been subjected to high temperatures in an age-old practice that is said to have originated in Sri Lanka some 2,000 years ago. In this process sapphires are heated to high temperatures to improve their clarity and to intensify their colors. Without this practice there would be fewer sapphires on the market at far higher carat prices due to restricted and reduced supplies. Heating sapphires makes otherwise expensive gems more accessible and more affordable.

The proportion of unheated sapphires on world markets is small and widely thought to be less than 1 percent. Although no more beautiful, their rarity makes them highly collectable, with prices set at a substantial premium in relation to heated stones of comparable weight, color, and cut. That premium has resulted in prices as high as three times those paid for an equivalent heated sapphire.

Gem Clarity

The following definitions of the clarity of a gemstone are used in the valuation process:

Clean – gemstones that are free of inclusions (imperfections), under 10X magnification.

Eye Clean – gemstones that are clean to the naked eye.

Crystal Transparent – gemstones that are transparent and have excellent brilliance. They may have some minor inclusions common to that particular gem type, but these are not significant enough to detract from their rarity and beauty. The word "crystal" is commonly used in all major global gemstone sources.

VSI (very slight inclusions) – gemstones that have small inclusions that do not diminish their brilliance or beauty when set in jewelry.

SI (slight inclusions) – gemstones that have some inclusions visible to the naked eye but not to the extent of affecting the brilliance of the gem.

Included/Pk (Pique) – gemstones that have some larger and/or many smaller inclusions that may somewhat diminish the brilliance of the gem.

Transparent – gemstones that allow light to pass through them without diffusing (scattering) the light.

Translucent – gemstones that allow light to pass through them, but the light is somewhat diffused (scattered).

PROCESSING OF NATURAL SAPPHIRES

The first step in bringing precious gemstones to market is to find them and mine them. Individual prospectors may find stones, in addition to commercial mining operations of companies.

After accumulating the rough stones, a process of heating them is usually used to enhance their color and improve their brightness and clarity. This is the most common treatment for processing both sapphires and rubies. Heat treatment is generally performed before selecting the rough stones for further processing. Some of the most extraordinary gemstone colors can only be obtained through the utilization of a heat treatment.

In the case of some precious and semiprecious gemstones, there is no variation in value between heated and unheated material. In fact, heating may actually increase a gem's value. Over the last decade unheated rubies and sapphires have been almost non-existent. Higher quality stones are usually verified as to whether or not they have been heated in their processing.

Selecting the rough material before cutting is one of the most important stages in the processing of gemstones. It requires a great deal of experience and expertise. Mistakes during selection can prove quite costly, as this step has a direct effect on the outcome of the finished product – carat weight, quality, and value in the marketplace.

The rough selector has the job of separating these gemstones into two groups; those that require further cutting and those that can be pre-formed. The clarity of the rough stone is carefully inspected using a special light source to determine whether it is necessary to cut the rough stone into two, three, or more pieces to obtain the best clarity.

Sliding, also referred to as cutting, is considered by many experts to be the most crucial stage in gemstone processing. It ultimately will determine the final size and color of the finished product.

Once the rough stones are selected for cutting, the gem slider will determine how to cut, where to cut, and how many pieces to cut, in order to produce the highest yield percentage. A sliding blade is applied to the stone and tapped precisely in order to break the stone apart in just the right location. An incorrect cut, with respect to either location or pressure, could adversely affect the final color, shape, and size of the stone, thus relegating a potentially exceptional gem to simply an ordinary gem.

Once the rough stone has been carefully cut, pre-forming commences. This process also requires experience and concentration. Pre-formers carry a great responsibility as they must determine the most suitable shape for each gemstone.

Pre-formers always bear in mind the weight of the finished product as they are also responsible for trying to maintain as much weight as possible during this process. In many cases, a qualified selector also assists in determining the final shape of a gemstone during the performing process.

The next step in processing is called shaping. While not all pre-formed gems go through this process, many are shaped to achieve a more accurate presentation and size. The shaper uses a special type of wax to affix the pre-formed gemstone onto a wooden stick. The shaper then delicately applies the gemstone to the shaping wheel. A great deal of precision is required by this process and an experienced pre-former provides a valuable contribution to the ultimate value of the stone.

Polishing is the final step in processing of gemstones. Once the stone has reached its ideal size and shape, it is taken to a polishing factory. Here the stone is placed on a polishing wheel to gently apply pressure in order to bring out its luster. The sapphire, birthstone for the month of September, and representing Taurus in the Zodiac calendar, is finally ready for sale.

COMPETITION AND DISTRIBUTION CHANNELS

The production and sale of sapphires is a segment of the industry defined by the U.S. Census Bureau as "Jewelry, Watches, Precious Stones, and Precious Metals." There were approximately 8,215 establishments in the wholesale sector of this industry in the census reports of the early 1990s. By 2003, this number had grown to 12,936. Annual sales that year reached $13.8 billion, with industry employment of 61,411, up from 54,408 ten years earlier. Average sales per wholesale establishment were $1.1 million. The majority of these establishments were quite small; 9,939 units had fewer than five employees.

The largest segment of the wholesale market sector sold jewelry and watches. In 2003, 4,872 establishments, 37.7 percent of all firms, produced $4.8 billion sales, 34.8 percent of industry sales. Firms selling jewelry and precious stones numbered 3,435 firms, 26.6 percent of all firms. They generated sales of $2.5 billion, 18.1 percent of industry sales. Wholesalers specializing in sales of diamonds numbered 1,327 establishments, 10.3 percent of all firms. Sales of $1.7 billion represented a 12.3 percent market segment. The remaining establishments and sales were handled by larger, more diversified firms.

The retail sales market for jewelry, watches, precious stones, and precious metals totaled $52.1 billion in 2003. There were 49,542 establishments engaged in these sales, employing 199,366 individuals. Sales of the jewelry segment of the market totaled $26.9 billion. Jewelry and watch stores numbering 32,704 units had sales of $13.8 billion. Stores selling jewelry, precious stones, and precious metals numbered 14,363 units, with sales of $12.4 billion.

The retail fine jewelry industry segment was divided into two type of enterprises; chain stores and independents, with chain stores predominant. In the early 1990s, after a slowdown in U.S. economic activity, poor sales and bankruptcies adversely affected the industry. However, by mid-decade sales were rebounding and continued strong for the next few years. A strong economy and low unemployment tend to boost sales of luxury goods, including jewelry. While past recession periods resulted in weak sales of jewelry, the early years of the 21st century generated a somewhat different pattern of experience. The overall industry sales continued to rise as the upper end of the market (the luxury segment) proved strong enough to compensate for weakness at the lower end of the market. By 2003, all segments were growing once again.

In the independent retail jewelry business, participants have fought a tough battle to maintain their identity as chain stores have used their size, buying power, and advertising muscle to increase their market share. While they have been losing market share, the specialty retail jewelers still accounted for $26 billion in sales in 2003, just about 50 percent of the market. Their business is highly seasonal, with 25 percent of sales being made in December. And diamond jewelry accounts for just under 50 percent of retail sales. This industry is highly fragmented, with no single operation controlling more than 6 percent of the overall market.

In the chain store segment of the market, some well known names lead in sales; Zale Corp is number one, with 1,345 outlets in the U.S. and Canada and sales of $1.5 billion in 2003. Sterling, Inc. and Tiffany and Co. are also well known market leaders. Tiffany is especially strong in the luxury segment of the market.

As the industry moved into the 21st century, both independent and chain store retailers faced heavy and growing competition from mass merchants, such as home shopping channels, mail-order firms, and discounters. These mass merchants, who were not even in existence only 30 years ago, have now taken almost 25 percent of the estimated $40 billion of fine jewelry and watch sales.

Another change in industry structure has been Internet sales. Online sales are now estimated at 1 percent of total retail sales, with exponential growth expected in the next decade. In order to remain competitive, jewelers have been setting up web sites; Zale and Tiffany already offer direct online sales. Specialty retailers now distribute catalogs in order to generate incremental sales.