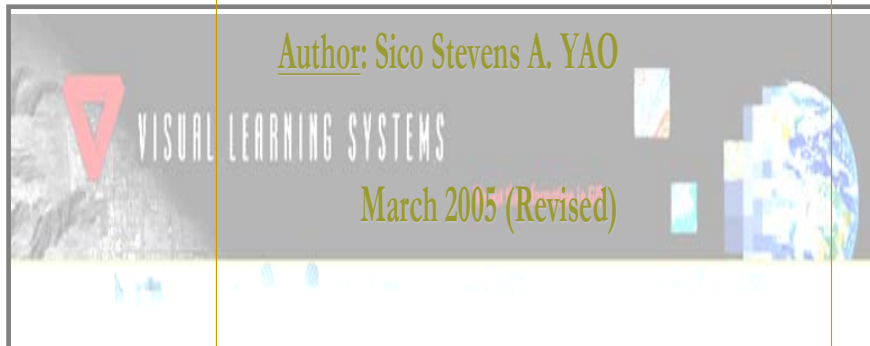


Visual Learning Systems, Inc.

IDENTIFICATION OF MARKET OPPORTUNITY IN THE
MEDICAL IMAGING FIELD

&

STRATEGY FOR MARKET PENETRATION



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DEFINITION OF COMMON TECHNICAL TERMS

Computed Tomography (CT): It is a test that combines x-rays with computer scans. The scans appear as slices. The result is a detailed picture that may show problems with soft tissue (such as the lining of sinuses), organs (such as kidneys or lungs), and bones. It also locates and measures the calcium deposits in the coronary arteries, which may provide an indication of how much hard (calcified) plaque is present. Computer tomography scanning scan allows for multiple x-rays to be taken from different angles around the patient. Computer analysis can determine a patient's risk of heart disease base on any calcification present. There is a small amount of radiation with CT. But the benefits of this test far outweigh any risk.

Diagnostic Imaging Centers: These are establishments primarily engaged in producing images of the patient generally on referral from a health practitioner.

Home Health Care Services: These are establishments primarily engaged in providing skilled nursing services in the home, along with a range of the following personal care services: homemaker and companion services; physical therapy, medical social services; medications; medical equipment and supplies; counseling; 24-hour home care; occupation and vocational therapy; dietary and nutritional services; speech therapy; audiology; and high-tech care, such as intravenous therapy.

Hospitals: They are establishments known and licensed as general medical and surgical hospitals primarily engaged in providing diagnostic and medical treatment (both surgical and nonsurgical) to inpatients with any of a wide variety of medical conditions. These establishments maintain inpatient beds and provide patient with food services that meet their nutritional requirements. These hospitals have an organized staff of physicians and other medical staff to provide patient care services. These establishments usually provide other services, such as outpatient services, anatomical pathology services, diagnostic X-ray services,

clinical laboratory services, operating room services for a variety of procedures, and pharmacy services.

Magnetic Resonance Imaging (M.R.I): A safe and noninvasive imaging test that can help physicians diagnose diseases of numerous organs and vessels including the heart, coronary vessels, brain and carotid arteries. MRI does not use x-rays. Instead, strong magnets and radio waves work together to form a sharp image. There is no x-ray radiation and the magnets and radio waves are harmless. Variant of the M.R.I test exists:

- Magnetic Resonance Angiogram (M.R.A) is being used to view blood through the coronary arteries or carotid arteries without the use of catheter-based technique.
- Phase-Contrast M.R.I is a M.R.I scan performed after the noninvasive technique.

Although other noninvasive techniques such as Positron Emission Tomography (P.E.T) are able to measure blood flow, they cannot assess heart function. M.R.I may be ideal for identifying the earliest stage of heart disease.

Offices of Physicians (except Mental Health Specialists): These are establishments of health practitioners having the degree of M.D. (Doctor of medicine) or D.O. (Doctor of osteopathy) primarily engaged in the independent practice of general or specialized medicine or surgery. These practitioners operate private or group practices in their own offices (e.g., centers, clinics) or in the facilities of others, such as hospital or health maintenance organization (HMO) medical centers.

Positron Emission Tomography (P.E.T): It is a noninvasive diagnostic test that takes three dimensions images of human tissues using relatively harmless radioactive tracers injected into the body.

Ultra-Sound: It is the use of high frequency sound waves for creating an image of internal body parts. It is used in diagnosing cardiovascular conditions, and to show growing evidence of the usefulness of echocardiogram in assessing the future risk of coronary event (heart attack). It can help assess pain or other symptoms in the pelvis (lower abdomen). In pregnant women, it is used to check the fetus.

X-Ray: It is an image of a body part, organ or bodily system on film paper or fluorescent screens. It is produced by using low doses of radiation.

EXECUTIVE SUMMARY

Visual Learning Systems, Inc. (VLS) is a growing software company specialized in the development of software and consulting solutions for the Geographic Information Systems (GIS) and Image Processing industries. VLS is exploring the medical imaging market with a new product development or a brand expansion in mind. In particular, the company would like to capitalize on the tremendous success of its key product Feature Analyst® by launching a new product that would benefit from their competency and experience in image processing. In view of the fact that innovation can be risky given the market uncertainty, technological uncertainty and competitive volatility characteristics of the high-tech environment, a complete market analysis of the medical imaging equipment market has been realized to include:

- Overview of key products and technologies used in medical imaging;
- Overview of customers their buying criteria; size of the market; segments in the market;
- Overview of key competitors and their relative position in the marketplace.

Based on the above information, a specific and detailed assessment of how VLS technology would potentially be used in the marketplace has been completed. In addition, we will discuss the best strategy for VLS to follow if it chooses to pursue this market which includes recommended communication strategies. Finally, questions regarding potential strategic alliances and partnerships have been addressed as well as financial implications.

I. SITUATION ANALYSIS

A. COMPANY BACKGROUND

1. Company history

Visual Learning System (VLS) was founded in 1997 in Missoula, MT by David Opitz and Stuart Blundell. But it is only in late 2001 that VLS's software, Feature Analyst®, was introduced after being awarded the Small Business Innovative Research grant from NASA in 2000. Feature Analyst® provides a mean to extract Geographic Information System (GIS) features automatically from digital imagery. It is sold as a software extension which operates with ArcGIS®, ArcView® and ERDAS Imagine®. Feature Analyst® is available for approximately \$10,000 per package or license. Its competing product eCognition®, is manufactured by a German company called Definiens Imaging.

2. Mission and objective

VLS's main mission is to assist customers with solutions to the challenge of capturing and maintaining current GIS data. The mission of the organization will eventually have to be broadened to acknowledge VLS operation in the medical imaging market.

3. Corporate culture

Performance-driven is the motto that underlines VLS corporate culture. In other words, VLS measures its success by the quality of its customers' experiences, achievements and personal growth using its innovative technology within their business systems.

4. Company resources and core competencies

a. Company resources

Identifying with exactitude the resources and the competencies of a firm is essential to making proper marketing decisions. More precisely, it provides the company with a benchmark for setting realistic and achievable marketing objectives. The company resources include its money, people, reputation, brand image and physical facilities.

i. Physical facilities

VLS office is located on 3rd Street in Missoula, MT. Even though VLS flagship product is used in over 50 different countries, it does not have any other branches. The totality of VLS operations is completed on the second floor of the building.

ii. People

VLS currently employs 16 people full time. The qualifications on the management team are as follows:

- CEO - Dr. David Opitz, PhD in Machine Learning
- COO - Stuart Blundell, Master's in Geophysics
- CFO - Bill Dunn, Master's in Finance
- VP of Sales - Kevin Opitz, MBA

iii. Reputation

Reputation is key element for companies deciding to penetrate the medical imaging marketplace. Feature Analyst® allowed the organization to establish a good name in the GIS sphere. Yet a young company, VLS has been granted the award of the most innovative solution in the ESRI ArcGIS® challenge contest.

iv. Financial resources

The R&D at VLS benefits from ongoing funding by the U.S Department of Defense and by the NASA to develop applications in the field of GIS and image analysis.

b. Core competencies

Core competencies refer to the set of skills at which the company excels. For VLS, it relates to its ability to enhance ArcGIS®, ArcView® and ERDAS Imagine® users' productivity. Features Analyst's® capabilities are not currently available in the systems it extends. The software is one-of-a-kind in the functionality and tool sets. The core skills and capabilities of VLS development team are bringing unique benefits such as speed, accuracy, reliability and power through machine learning applications.

5. Technology overview

Machine learning is the technology which the company revolves around. It is a major constituent of VLS assets. Machine learning technology is a programming technique based on a hierarchical learning approach. For protection against imitation, the source code of the software is not accessible by the end-user. Nevertheless, VLS offers the possibility to customize the software as an additional service which costs varies according to the project at-hand. Driven by a bifocal vision, VLS is however generating ideas about a new open source version of Feature Analyst® for the company's strategy to be consistent with the software industry trends.

B. VALUE CHAIN

1. Clients

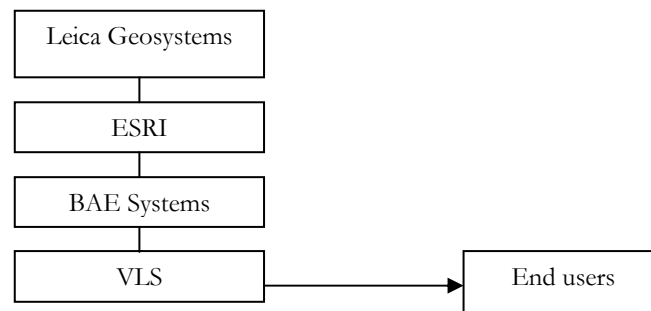
VLS has different categories of client which vary from commercial organizations, governmental institutions, to academic and research institutions. The company selective pricing strategy is based on those different client categories.

2. Partners and strategic alliances

VLS's marketing strategy includes strategic alliances with key partners like BAE Systems, ESRI, and Leica Geosystems. VLS relationship with its partners can be described as a win-win relationship. In summary, VLS agreed to provide a product to their partner which allows them to offer a complete solution of their products. Thus, VLS's partners benefit from competitive advantage which results in an increase market penetration rate, whereas VLS gains free publicity of its product as well as new markets to increase the diffusion of their product.

VLS currently deliver its product through a direct distribution channel which can be summarized in Figure 1.

Figure 1: VLS Direct Distribution Channel for Feature Analyst®



C. MACRO-ENVIRONMENT: TRENDS IN THE MEDICAL IMAGING MARKET

1. Demographic environment

The U.S population is aging at a rapid pace. According to the U.S Bureau of Census, the U.S population of individuals aged 55 and over is projected to grow significantly. The aging of the population will drive the need for a greater imaging utilization.

2. Economic environment

National health expenditures are expected to increase significantly in the coming years while the dropping of reimbursement rate will continue to affect some diagnostic medical equipment sales.

3. Technological environment

The technological progress in processors and computer systems has dramatically increased data processing speed which in return permits the utilization of more complex software in the medical imaging industry. Another significant technological improvement is the development of high-speed or broadband Internet which has been contributing factor to the development of e-business. Finally, we should point out that the new regulation “Check 21” is going to affect business transactions in the sense that electronic check will constitute not only a formal means of payment, but also a way to speed up business exchanges.

4. Legal and regulatory environment

There is a political will for using technology to improve the healthcare system, reduce costs and drive out medical mistakes. In fact, President George W. Bush's State of the Union Address in January focused on the need for an electronic health record (EHR) which he states by the following terms: "By computerizing health records, we can avoid dangerous medical mistakes, reduce costs and improve care." His budget request for fiscal year 2005 will include \$100 million for projects that adopt health information technology, twice as much as the current funding.

D. MARKET AND CUSTOMERS ANALYSIS

1. Segments

The medical imaging market can be segmented in two different ways.

a. Segmentation by technology application (NAISC 334510, 334517)

A study made by Fredonia identified a total of 10 segments in the medical imaging equipment industry which are:

- Digital radiography (X-Ray) market
- Mammography market
- Computed tomography (CT) market
- Magnetic resonance (MR) market
- Ultrasound market
- Gamma camera market
- Positron emission tomography (PET) market
- Picture archiving and communication systems (PACS) market

- Cardiology image management market
- 3D imaging market

A description of the key modalities used in medical imaging can be found at the beginning of the document in page 3.

b. Segmentation by healthcare facilities (NAISC 621, 622)

A study from Fredonia determined 5 different segments which are listed below according to their market size importance. They are:

- Hospital market (NAICS 622110)
- Outpatient facilities market (includes diagnostic imaging centers with NAICS 621512)
- Physicians' offices market (NAICS 621111)
- Home health care market (NAICS 621610)
- Other markets (dental offices, veterinarians' offices, educational, all other)

A definition of the different types of healthcare facilities can be found at the beginning of the document in page 3.

2. Size of segments

Figure 2: Medical imaging equipment market share in percentage by modalities, 2003

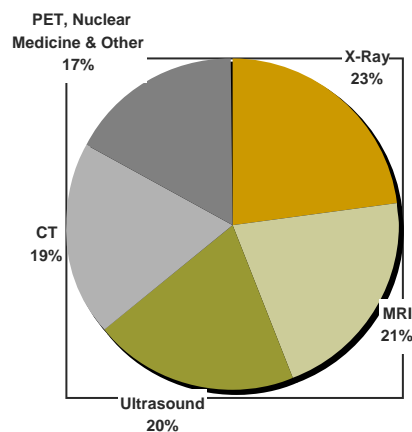
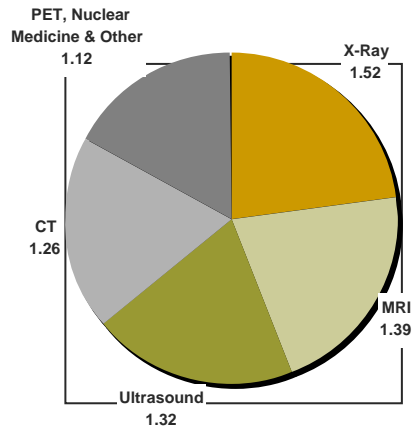


Figure 3: Medical imaging equipment market share in billion by modalities, 2003



3. Growth rate of segments

Different data sources converge to the same conclusion regarding the forecast of the medical imaging equipment market. U.S demand for diagnostic imaging equipment is expected to grow 7.6 percent per annum from \$6.6 billion to \$9.5 billion in 2008 according to a study conducted by Freedonia. Though radiology is expected to continue to be the prime user of imaging technologies, its total exam volume is anticipated to decline in the coming years¹. Nevertheless, a steady growth for conventional X-ray machines and ultra-sound scanners will be observed in physicians' and dentists' office markets. Outpatient facilities represent the second largest market for medical imaging equipment behind hospitals, one that has exhibited above average growth over the past decade. This segment encompasses 5,000 diagnostic imaging centers whose primary purpose is to provide pre-admission and other diagnostic testing services. Diagnostic imaging centers utilize all types of medical imaging equipment including expensive items such as CT and MRI scanners. The following table (Table 1) provided by the Academy of Molecular Imaging offers more information about growth rates in specific segments as well as other relevant data. Information on x-ray equipment was not available.

¹ "Development of Novel Contrast Agents to Drive Imaging Procedure Volumes," *Research Overview*

Table 1: Size of Diagnostic Imaging Industry, Growth Rate of Segments and Products Information

	Ultrasound	CT scanners	MRI Scanners	PET
Number of hospitals that have these machines (2001)	(Probably close to 100%)	3,779 (79.9%)	2,412 (51.0%)	242-300** (Probably less than 10%)
Examples of uses	Monitor fetal development	Show whether stroke is caused by blood clot or hemorrhage	Detect brain tumors	Show stage of cancer
Benefits of use described above	Determines whether intervention is needed	Indicates whether it is safe to give clot-busting drugs	Replaced exploratory surgery	Determines whether surgery is indicated or cancer has spread so that only chemotherapy is indicated
Typical cost of machine*	\$250,000	\$1.2 million	\$1.35 million	\$1.2 million
Expected annual growth rate in sales, 2000 to 2005	5.8%	8.9%	4.0%	14.3%

*Installation can add significantly to the cost, particularly for MRI machines, which require shielding.

**This is an estimate of the number of machines in the U.S. based on the list of facilities provided by the Academy of Molecular Imaging (<http://www.ami-imaging.org/public/petcenters>, retrieved July 2, 2003) and estimates by Booz Allen Hamilton.

***These machines, especially ultrasound and MRI, are increasingly being found in physicians' offices. Often, these machines are smaller and can do more limited tasks than hospital-based machines. For example, weaker MRIs are used by orthopedists to scan knees and other joints.

4. Customer behavior issues

a. Health care providers behavior issues

Customer behavior is defined as the complex process by which individuals acquire, use and dispose of products or services to satisfy their needs and desires.

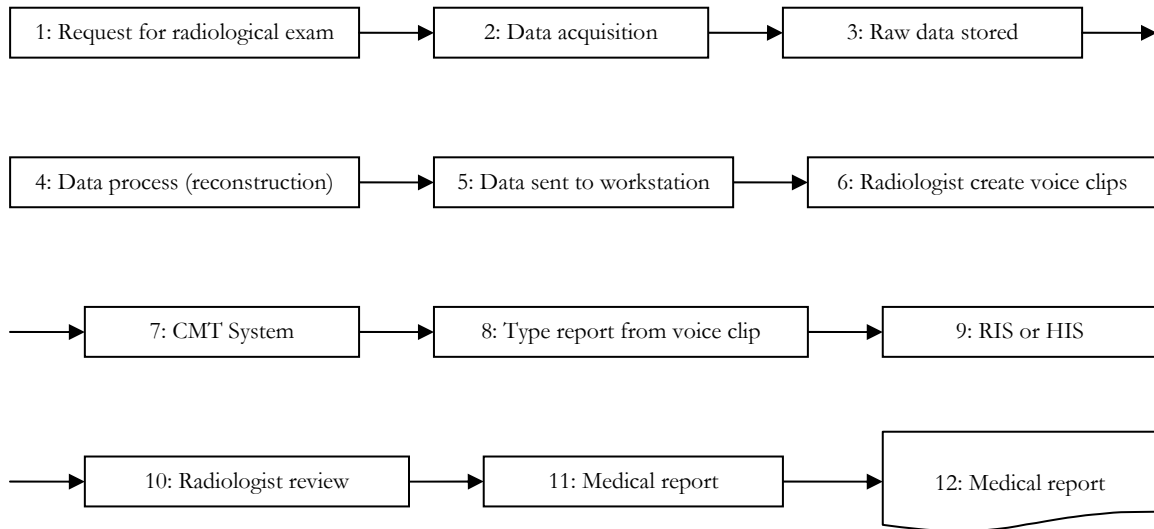
Medical diagnostic equipment is very expensive which costs anywhere from \$250,000 for an ultrasound device to \$1.35 million for a MRI scanner. However, pricing evaluations in health care facilities also take into account repair, maintenance services, training as well as nonmonetary costs which most importantly are the risk of obsolescence and the risk of product failure. Thus, acquiring new diagnostic equipment represents a considerable financial investment for health care facilities. The consequence is that the majority of this type of medical equipment is found in health care facilities with important financial assets namely hospitals, which can carry more than one single type of equipment and outpatient facilities respectively. One major implication for the buying decision process is that more time is spent searching for the best supplier by considering different offers. Meanwhile, marketers often arrange for buyers to visit other customers to evaluate the product and to

speak with them. During an interview at Saint Patrick Hospital in Missoula, MT, an employee from the Imaging and Therapeutic Services revealed that they had to travel to 6 remote locations at the cost of the OEM for testing and evaluation purposes of the medical diagnostic systems before they actually bought it. This example illustrates the importance of decreasing the FUD (Fear, Uncertainty and Doubt) factor in the buying decision process in this particular industry and the resulting cost that can be relatively expensive for the manufacturer. The purchase decision in hospital usually involves a group of individuals or a committee (manager, director, supervisor, administrator, etc.). In the evaluation of alternatives, health care providers also estimate the time needed to amortize their investment. The replacement cycle of the medical imaging equipment is about 8 to 10 years and the use of the different core modalities is very similar. However, to capture a good understanding of their use we decided to “get inside the lives of our customers” to learn their scenario which is defined as the broad context in which a customer does business. Thus, we found out from an interview with the imaging and therapeutic services at Saint Patrick Hospital that there are 12 steps involved in medical imaging procedures. Additionally, we discovered that there was approximately one hour between the request for a scanner exam and the establishment of the final report. This information is summarized in the chart flow in Figure 4.

b. OEM behavior issues

Not much information has been found regarding OEM behavioral related issues. Pertinent information about OEM concerns their strategic alliances and acquisitions which will be discussed in later sections.

Figure 4: Medical Imaging Information chart flow²



c. Patients behavior issues

Patients are at the high end of the supply chain. They are the end-users of the medical imaging technology. An understanding of their behavior may reveal their expectations from healthcare facilities which in return can eventually drive the demand for more medical imaging equipment.

The use of medical imaging equipment has life-saving implications which justify the patients' willingness to cover associated costs with the medical diagnostic procedures. Nevertheless, cost of healthcare tops the list of American's healthcare concerns according to a survey released by Siemens Medical Solutions. Thus, even though 51 percent cited imaging technologies as more important than other factors in impacting cost, 84 percent of respondents said imaging technologies will be important in contributing to overall better healthcare and 64 percent said imaging technologies are more important than other factors

² Source: Imaging and Therapeutic Services, St. Patrick Hospital and Health Sciences Center - Missoula, MT

in contributing to improved overall process of treating and handling patients end-users perspectives.

5. Customer behavior issues within each segment

There is a high rate of acceptance of the multi-slice CT even though some resistances may persist because of new development in CT scanners that would obsolete previous versions which is referred to as technological uncertainties. Many believe that the 16 slice would be the dominant version of CT for at least a few years, which was not to be, as 32 and 40 slice models soon started grabbing attention.

Meanwhile, conventional systems such as Ultrasound and X-ray scanners remain the preferred medical imaging devices for many physicians' and dentists' offices because of their relatively low costs. In addition, no side effects to patients and medical personal have been associated with the use of ultrasound equipment.

Finally, the competition posed by hybrid PET/CT which seems to have a success usurps some sales of stand-alone PET.

E. COMPETITION

Consolidation is rapidly changing the competitive landscape as the market has largely been reduced to the "Big 3" manufacturers: GE Healthcare, Philips Medical Systems and Siemens Medical Solutions. A more exhaustive list of companies competing in the medical imaging market can be found in the Appendix. The underlying strategy of growth through acquisition has been instrumental in assisting OEM companies in their quest to becoming total imaging solutions providers.

1. Business highlights

Table 2: Business Highlights of the Competitors in the Medical Imaging Market

Company	Business Highlights							
	2003 Revenue*		2003 Profit*		R&D*	Headquarter	# Employees	
	Number	% change	Number	% change	Expenditures	location	World	U.S.
GE Healthcare	\$10,198	13.9%	\$ 1,700	10.0%	\$ 1,000.00	UK	42,500	N/A
Philips Medical Systems	\$ 7,398	12.5%	N/A	N/A	N/A	Netherlands	N/A	N/A
Siemens Medical Solutions	\$ 9,165	7.0%	\$ 1,381	10.0%	\$ 832.32	Germany	30,000	13,000
Toshiba Medical Systems	N/A	N/A	N/A	22.5%	N/A	Japan	N/A	1,000

*Number in millions of dollars

N/A = Not Available

Source: US official web sites of respective companies

2. Core competencies/Reputation

Table 3: Core Competencies and Reputation of Competitors in the Medical Imaging Market

Company	Core Competencies	Reputation
GE Healthcare	Medical imaging & IT, patient monitoring systems, healthcare services	#1 health care IT in terms of revenue (Year 2004)
Philips Medical Systems	Medical systems for diagnosis & treatment, healthcare services	#1 medical imaging company (2003 Frost& Sullivan Award)
Siemens Medical Solutions	Imaging & therapy syst., electromedecine, hearing instruments, IT, data manag. solut., services	#1 world's electronic industry, largest applicat. service
Toshiba Medical Systems	Medical imaging equipments	Medical imaging product of the year (16 slice CT scanner)

Source: US official web sites of respectives companies

3. Marketing key elements

Table 4: Target Market, Strategic Alliances and Internal Analysis of Competitors in the Medical Imaging Industry

Company	Target Market	Strategic Alliances	Strengths	Weaknesses
GE Healthcare	High-growth physician market, hospitals, outpatient care	Not available	Market leader, culture of innovation	Too many products to manage
Philips Medical Systems	Hospitals	Cleveland Clinic Foundation, Epic Systems Corp., EP MedSystems, University of Chicago Hospital	2 nd market leader, culture of innovation, Strong tie & presence in China, world's leader in cardiac & vascular imaging for diagnostics	Too many products to manage
Siemens Medical Solutions	Hospitals	Universities, Hospitals, Medrad, Inc., Agfa Healthcare	3 rd market leader, organization structure, culture of innovation	Too many products to manage
Toshiba Medical Systems	Imaging centers, community hospitals, rural facilities	Plymouth, Minn.-based Vital Images, top cardiologists at Johns Hopkins University School of Medicine	Competitive advantage in the CT market, culture of innovation	Lack of complete solution

4. Marketing strategy

Table 5: Marketing strategy of competitors in Medical Imaging Industry

Company	Marketing Strategy			
	Products	Services	Promotion	Distribution
GE Healthcare	Accessories, supplies, biopharmaceuticals, cardiology, computed radio., CT, MR, nuclear med./PET, replacement parts, software, ultrasound, X-ray	Education, asset, healthcare financial, biomedical, parts & accessories, productivity solutions, drug discovery	Product placement (NBC Drama ER), cause related marketing, publicity	US market, Europe, Asia, Middle East, Australia
Philips Medical Systems	X-ray, ultrasound, MR, CT, nuclear medicine, PET, radiation oncology syst., patient monitoring, info. manag. Xts, resuscitation Xts	Asset manag., training & education, business consultancy, financial services, e-care business services	Publicity	U.S market , Europe, Asia (specifically China)
Siemens Medical Solutions	Anesthesia syst., angiography, CT, fluoroscopy, intensive care syst., MR, mammography, nuclear med./PET, oncology care, radiography, ultrasound, urology	Accessories & supplies, refurbished syst., IT solution & consulting, surgery, technical assistance	Publicity, press release, company newsletters, testimonials, internet advertising	U.S market (48% of revenue), Europe, Australia, China
Toshiba Medical Systems	Cath lab, CT, nuclear medicine, ultra sound, MR, vascular X-ray, X-ray	Services solutions, training & education, materials management, installation	Trade shows, publicity, press release, training, interviews	US market, Europe, Asia (specifically Japan - about 50% of revenue from Asia market)

Xts = products

5. Acquisitions

Table 6: Acquisitions from competitors in the diagnostic medical industry

Company	Acquisitions		
	2002	2003	2004
GE Healthcare	MedicaLogic, iPath, Visualization Technology, Surgical Insights, Viewpoint, USA Instruments	Ambassador Medical, Millbrook Corporation, Thales Ultrasound Probes, Triple G Systems Group, Instrumentarium Corporation	Amersham
Philips Medical Systems	1998	2000	2001
	ATL Ultrasound	MedQuist (70%), CardioLogica software (Copyrights), ADAC Lab, Agilent's Healthcare Solutions Group	SHL Telemedicine Ltd. (18.5%), Philips Heartcare Telemedicine Services Europe (80%), Marconi's Medical Sytems
Siemens Medical Solutions	2000	2001	2003
	Shared Medical Systems Corporation, Acuson Corporation	Community Healthcare Connection Division of Pointshare Corporation	Radiation therapy activities of MRC Systems GmbH
Toshiba Medical Systems	Not Available	Not Available	Not Available

D. SWOT ANALYSIS

1. Strengths

One of the internal strength of VLS is the company's human and intellectual capital. Employees have necessary technical skills and have proven their ability to innovate through their creative talents. A second strength is the performance-driven organizational culture which enhances customer satisfaction. The last strength is the size of the entity which provides VLS with a greater flexibility to adapt to environment changes.

2. Weaknesses

VLS is a relatively new company in the GIS market and its software Feature Analyst® has been on the market for about 3 years. Moreover, VLS as a brand name remains an unknown company from the diagnostic equipment industry.

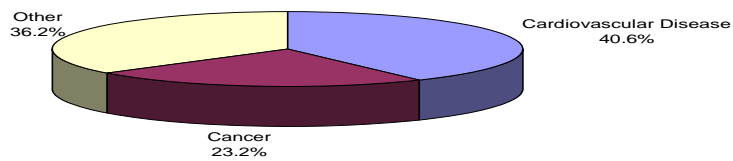
3. Opportunities

According to an article from the *Business View Trends* published in August 31, 2004, "heart disease affects the lives of nearly 65 millions Americans and is the leading cause of death in the U.S." As reported by the Association of Heart Disease, the number of deaths from cardiovascular disease increase to 79 percent for people aged between 55 and 64, compared with people aged 45-54 years. Another important figure is the number of deaths due to cancer which statistics reveal is actually the second leading cause of death in the US³. Those alarming figures will generate a high demand in diagnostic equipment for the years to come.

³ Source: CDC/NCHS and the American Heart Association

Next is the staffing shortage in the healthcare industry which obliges health care facilities to rely on technologies for automated tasks.

Figure 5: Cause of Death, U.S. 1998 Final Data⁴



4. Threats

One external threat is the high entry barriers from established medical imaging original equipment manufacturers (OEM) in an environment where strategic alliances and acquisitions are very common practice. Another external threat is the rapid pace of innovation that narrows the product lifecycles and restricts spending. Finally, price concerns restrict a wide scale market penetration of diagnostic equipment.

⁴ Source: CDC/NCHS and the American Heart Association

II. RECOMMENDATIONS

A. MARKET PENETRATION STRATEGY

We recommend VLS to penetrate the US medical imaging market by offering software to hospitals and outpatient facilities that would be an extension of the existing Toshiba CT systems. In particular, VLS should sell its product for approximately \$28,900 which will exhibit benefits of error reduction and improved productivity. This new product introduction would generate approximately \$10,000,000 in revenue by the end of 2007. Supporting details are discussed in the quantitative analysis and qualitative analysis sections.

1. Data analysis

a. Quantitative Analysis

For our initial strategy of penetration, the U.S market is the most flourishing with about 58 million (± 9 million) CT examinations and procedures performed against 93 million worldwide⁵. Thus, the U.S alone represents approximately 62 percent of the global CT market. With an estimated 4,730 hospitals and 5,000 diagnostic imaging centers in the U.S, we can evaluate the number of CT scanners per manufacturers' platform or program in our target market considering that there are an estimated 14,000 CT scanners⁶ in the US.

One of the "Big 3" manufacturers⁷: $14,000 \cdot .25 = 3,500$ CT scanners

Toshiba⁸: $14,000 \cdot .10 = 1,400$ CT scanners

⁵ Source: Nationwide Evaluation of X-ray Trends (NEXT) survey of patient radiation exposure from CT by the Food and Drug Administration in 2000 to 2001

⁶ Fergus V. Coakley MD, Benjamin M. Yeh MD (2002), "Multislice CT: A Revolution in the Making?", <http://www.imagingeconomics.com/library/tools/printengine.asp?printArticleID=200204-02>

⁷ Based on a 25 percent market share estimate

⁸ Based on 10 percent market share estimate

Given that there are 7,800 CT facilities⁹, there is an average of 1.8 scanners per CT facilities. Hence, hospitals most likely carry out more than one CT scanner in average.

We were not able to find some specific data on the market size by healthcare facilities. Nevertheless, we estimate that the hospital market and the outpatient facilities market represent at least 90 percent of the market for CT and MR scanners. Both hospital and outpatient facilities market have interesting characteristics as the hospital market represents the most important segments in term of size, whereas the outpatient facilities market is the fastest growing segment for CT and MR scanners. Both markets are also more likely to be equipped with diagnostic imaging systems, which are a prerequisite for the sale of VLS software. Selecting one segment or the other would not be adequate because it would leave VLS with a small market size given that those 2 markets have to be broken by manufacturer's software or platform.

VLS solution is suitable for hospitals and outpatient facilities which in general experience a higher volume in imaging procedures than other healthcare facilities. Thus, the time saving benefit of the software will be more apparent to those consumers in an industry suffocating from a staff shortage.

The price suggested for the software seems relatively expensive. However, Table 7 shows that one day of operation could be enough to recoup the amount of dollars invested in VLS's software since a typical community hospital may carry out over 30 CT scans alone per day¹⁰. In fact, with about 58 million of CT examinations, we can estimate the average number of CT examinations carried out per business day for a typical CT facility which is $58,000,000/52/5/7,800 = 28.6$ CT scanners per day.

In addition, the table suggests that a return on investment is higher for the CT and MR segment which provides the customer with an additional incentive. The method we used here integrates the relative frequency of use for each diagnostic procedure based on a study of roughly 3 million plan members by BlueCross BlueShield in 2001. But the evaluation of the different segments by technology applications in Table 1 suggests that the CT segment is

⁹ Source: Nationwide Evaluation of X-ray Trends (NEXT) survey of patient radiation exposure from CT by the Food and Drug Administration in 2000 to 2001

¹⁰ Source: Imaging and Therapeutic Services, St. Patrick Hospital and Health Sciences Center - Missoula, MT

the fastest growing with an annual rate of 8.9 percent against 4 percent for the MR segment which justifies our choice for the CT segment.

Table 7: Return on Investment for VLS Software in a Typical Hospital

	X-ray	Ultrasound	CT scanners	MRI scanners
Software cost*	\$ 27,455	\$ 27,455	\$ 27,455	\$ 27,455
Average cost of procedure	\$ 50	\$ 65	\$ 900	\$ 1,000
Typical number of procedures	150	65	30	27
Return On Investment (ROI)	27.32%	15.39%	98.34%	98.34%

Proportion 55:24:11:10 on 272 procedures according to study from BlueCross BlueShield

*Special introduction rate of 5% off

CT technology has already crossed the chasm to reach the main stream market in the technology adoption life cycle and most of the demand will be for replacement. Thus, the demand for VLS software should not suffer from a reported slow growth of CT market.

Assuming that the number of CT equipment sold per year increases according to the expected annual growth rate in sales, we can estimate the number of number of CT scanner sold per year from the data in Table 9.

Table 8: CT Equipment Sold per Year, 2000-2007

2000	2001	2002	2003	2004	2005	2006*	2007*	Total CT Sold 2000-2005
576	627	683	744	810	882	961	1,046	4,323

* Projection assuming the same rate growth

Table 9: Sales of Imaging Equipment, 2000 to 2005

Type of Imaging	2000 Equipment Sales* (millions)	2005 Equipment Sales* (millions)	Total Equipment Sales, 2000-2005*	No. of Machines Sold, 2000-2005*
Ultrasound	\$ 1,100	\$ 1,458	\$ 6,396	\$ 25,582
MRI	\$ 940	\$ 1,144	\$ 5,209	\$ 3,859
CT	\$ 820	\$ 1,256	\$ 5,190	\$ 4,325
PET	\$ 34	\$ 66	\$ 250	\$ 300

*Projected

Source: Booz Allen Hamilton, 2003

b. Qualitative Analysis

Hospitals constitute a good beachhead for the diffusion of VLS's new technology to pursue a mainstream market as hospital have compelling reasons to buy VLS's product. The niche market (CT/hospital & outpatient facilities) has been chosen accordingly with the firm's capabilities to serve the given segment.

Another consideration that was taken into account is the competition between OEM's for the creation of innovative and more compelling CT machines. In fact, Toshiba America Medical Systems, Siemens Medical Solutions, Philips Medical Systems and GE Healthcare made the list of the "RT Image's 25 Most Influential" for their innovation in CT technology, a list which recognizes the movers and shakers in the radiology industry. In an environment characterized by a constant succession of innovation, complete solutions are capital. This is where VLS can make a difference if it decides to offer a compelling product which would complement the product of the chosen partner(s).

Lastly, not only have cardiac applications to CT scanners made them valuable for cardiologists but also studies have shown that CT technology is an effective tool for lung cancer detection in early stages of development¹¹. These two factors are significant in our decision to favor the CT segment, since cardiovascular diseases and cancers are the two leading causes of death in the U.S as reported in Figure 5.

2. Implications

a. Target market and positioning

The target market is the CT segment for hospitals and outpatient facilities or diagnostic imaging centers. VLS has limited resources to be effective in multiple markets and therefore should not spread its resources too thinly in order to increase its chance for success. By adopting a concentrated target strategy, VLS can minimize the risk of failure given the lack

¹¹ Dow Jones Newswires (2004), "Study: CT scans should be used to screen for lung cancer", <http://www.smartmoney.com>

of awareness of VLS brand among the target audiences and VLS vulnerability to imitations from companies with more financial resources and larger distribution networks.

VLS should position its product as a product delivering accuracy in data analysis and improved productivity. The accuracy component makes sense as medical errors remain one of the burning issues in the healthcare industry. The improved productivity remains not only a relative advantage for the client but also provide VLS with a mean to affect customer purchase decision. This position reflects customers' needs addressed in the behavior issues section.

b. Penetration strategy

Our strategy of initial penetration consists in positioning VLS software as a complementary product to one of the most influential players in the network. This will give VLS immediate access to many other players in the network.

Historically, focus in the diagnostic equipment industry has been on reducing the time of the data acquisition. In fact, a typical CT scan procedure used to be performed in several hours to acquire the data for a single slide, and took several days to reconstruct the corresponding image when the technology was first introduced in the early 1970's by EMI, Ltd¹². With today's technology, a CT scan procedure is a matter of seconds. In attempt to differentiate its offer, VLS should penetrate the medical imaging market with product which would improve the functionality of OEM system by reducing the time between the report elaboration and acquisition of the data. A more complete solution from VLS would require competences beyond VLS's core skills. Furthermore, given the number of established firms in the diagnostic equipment market, it would be difficult for VLS to compete in an existing product category.

Our strategy for an initial market penetration will ultimately rely on building complementary alliances with key industry players to be able to gain access to resources and skills in a timely, more cost-efficient manner and access new markets. Though barriers to imitation could be

¹² Fergus V. Caokley MD, Benjamin M. Yeh MD (April 2002), "Multislide CT: A revolution in the making?", <http://www.imagingeconomics.com/library/tools>

high, those alliances remain fundamental for the success of VLS considering that the firm does not have all requisite skills and that there are capable competitors. We also envision the product to be launched before the beginning of the fiscal year 2005-2006 in order to allow companies to plan for the purchase of VLS new product. More details of our strategy can be found in Part B of this section.

3. Marketing objectives

In order to achieve VLS success in the medical imaging market, we retained 4 marketing objectives that we believe realistic. There are:

- Improvement in service to develop customer loyalty
- Increase brand awareness
- 1.5 percent penetration rate from September 2005 to December 2005 (6 percent annual penetration rate)
- Increase sale respectively to 60 percent and 100 percent in 2006 and 2007

Those goals are achievable since the market CT technology market is expected to grow at a high rate of 8.9 percent.

B. MARKETING MIX

1. Product

a. Description

VLS machine learning technology should be used to provide a more complete and sophisticated analysis. To some extent, the technology should allow both to automatically reconstruct organs from raw data and generate reports based on automated features

extractions in a 3-D environment. Those reports should be able to be imported from any component of Microsoft Office for ease of use or from major Picture Archiving and Communication Systems (PACS). However, the software will have to stay in constant development for eventual addition of modules or components for automatic updates from the Internet in order to facilitate the migration of existing customer toward the newer versions to come.

b. Features and key benefits of the product

The right mix of features and benefits is capital for the success of the new product. It will determine the success of our new product. However, making the decision to adopt a new technology is perceived as a risky decision from a customer standpoint. Thus, to better assess the benefits of our new concept, we need to understand and examine the 6 factors affecting customer purchase decision. With the customers’ behavior issues in mind, it will allow us to determine the right combination of features.

Table 10: Six Factors Affecting Customer Purchase Decisions

Factors	Objectives
1. Relative advantage	Increasing the benefits of adopting the new technology compared to the costs
2. Compatibility	Insuring compatibility with existing systems
3. Complexity	Conceiving a product which is easy to use
4. Trialability	Making sure that the product can be tried during a period of time
5. Ability to communicate product benefits	Offering a product which benefits can be easily communicated to prospective customers
6. Observability	Delivering a product which benefits can be easily observable to the customer using the product and to other customers

Source: Jakki Mohr (2004), *Marketing of High-Technology Products and Innovations*, (New Jersey: Pearson Education), p.173

The objectives in Table 10 will drive our marketing strategy which will be tailored to meet the above criteria even though complexity and trialability are the easiest factors to address.

The relative advantage criterion is somehow met when hospitals’ productivity is improved as we delete steps 6, 7, 8 and 10 from the information chart flow in Figure 4. In fact, VLS’s software will automate these tasks which should reduce the number of medical errors occurring during the reporting process. Table 11 provides evidence of cost benefit incurred from using VLS software. The goal sought is to communicate the relative advantage of the new product to potential customers.

Table 11: Cost Benefit Incurred When Using VLS Software

Steps	Action	Time saved per procedure	Cost saved per procedure	Cost saved per day
6	Radiologist creates voice clip	5 min	\$ 8.50	\$ 255.00
7	Voice clip is stored in the system	0 min	\$ -	\$ -
8	The office assistant type the report	10 min	\$ 1.50	\$ 45.00
10	Radiologist review the report	2 min	\$ 3.20	\$ 96.00
Total cost saved			\$ 13.20	\$ 396.00

Note 1: We estimated the time for the different step from the information provided at St Patrick Hospital

Note 2: We assumed a \$9/hours pay for the office assistant and a \$102/hour for the physician radiologist which data are lower than the national average

Note 3: We assumed an average of 30 CT scans per day for a typical hospital

The table above shows that cost of VLS software can be amortized within 4 months (86 working days) of operation. This table should be used to justify the software’s low cost of ownership in contrast with the competitors’ products. Table 12 summarizes the key features and benefits of the new product. Issues related to others factors will be addressed in others sections.

Table 12: Key Features and Benefits of VLS Software

Features	Benefits
Accuracy	Reduced the number of medical mistakes
Compatibility	Integrate with existing systems
Reliability	Reduced number of bugs and frozen cases
Speed	Improved productivity
User-friendly	Easy to use and to learn

c. Services

VLS can gain incremental revenue by offering additional services. Individual trainings and seminars are necessary because they address the complexity factor in the customer purchase decision. I also recommend a higher level of assistance to its customers by providing its clients with a toll free number easy to memorize such as 1-800-VLS-HELP or 1-800-VLS-INFO as it will increase VLS credibility to its partners. Likewise, customization and consulting services should also be part of VLS strategy which provides the double advantage of increasing customer satisfaction and generating incremental revenue for the future if prices of the software were to be dropped due to the nature of the high-tech pricing environment.

d. Other marketing considerations

Before the final stage of the product development, we recommend that a market test be done in order to receive the first customer's reactions. This is an opportunity for VLS to make corrections and modify its strategy accordingly. If there are a great number of negative feedbacks, VLS should consider canceling the launch of its new product. In case of success or fewer negative feedbacks, VLS need to reflect on extending their product line with the development of application for the MRI and Ultrasound medical equipment. Later on, it will be interesting to design a package to integrate the different platforms and modalities that will be available for a discounted price.

2. Price

In pricing considerations, it useful to refer to the 3 C's which stand for Cost – Competition – Customers.

We primarily based our prices on competitor's offers since a cost structure model sometimes underestimates the impact that markets have on profitability. Thus, we summarized the proposed prices in Table 13.

Table 13: VLS Pricing Table

Products	Prices	Remarks
Customization	To be determined	Depends on the level of customization
Installation	\$ 1,000	Could be readjusted in the future
Software	\$ 28,900	Voxar sells its software for \$30,000
Update	Free	To improve the quality of the product
Upgrade	\$ 10,000	To keep old customers

Given the quality of our product, we fixed our price approximately 5 percent below Voxar’s CT application. Voxar is a leading company in 3D medical imaging, headquartered in the UK which has just been acquired by Barco.

ABOUT VOXAR COLONSCREEN
Voxar Colonscreen ® has been designed to provide radiologists and clinicians with a complete virtual colonoscopy workflow solution. The CT colonography software, allows you to visualize supine and prone CT DICOM datasets simultaneously in 2D and 3D modes, automatically generating Windows and PACS compatible reports on-the-fly as you diagnose.

Even if the price constitutes the major concern, all else being equal, we did not really want to suggest a lower price as every eighteen months or so, improvements in technology cut price in half for the same technology¹³. Thus, the price has to be high enough in order to leave us with the possibility to beat the competition. Nevertheless, we can always show that the total cost of ownership is relatively lower given the wider field of application of our software.

3. Promotion

VLS has gained a good reputation in the GIS field and can capitalize on the success of Feature Analyst® Yet, VLS remains unknown in much of the medical imaging industry compare to big players such as GE Healthcare, Philips Medical Systems and Siemens

¹³ Source: Jakki Mohr (2004), *Marketing of High-Technology Products and Innovations*, (New Jersey: Pearson Education), p.289

Medical Solutions whose names are even recognizable by most word processing software. Thus, an intensive promotional campaign will be needed to increase brand awareness and increase sales.

a. Preannouncement

VLS should preannounce its new product three months before its release (September 2005). This will provide VLS with the pioneering advantage etiquette as long as the amount of information disclosed is controlled. Also, it will help customers plan for their future need while allowing them to have input in order to develop a product conformed to their need. Ideally, the timing should coincide with the purchase cycle of hospitals which we assumed to be the national fiscal year¹⁴.

b. Integrated promotional campaign

Our objective is to coordinate a promotional campaign that will deliver a clear focus and consistent message to the target audience which includes business partners and healthcare facilities. The message of the promotional campaign will have to integrate the product benefits while being coherent with the objective sought by the partners. The logo and the slogan of VLS will have to be included on all promotional materials in order to help establishing a brand identity. The promotional mix used to deliver the message has to be chosen in accordance with the premise of the advertising and promotion pyramid (Figure 6 in page 41) which dictates that less expensive tools on a per-contact basis with broader reach be used before the ones at the highest level of the pyramid.

i. Public relations

There are several vehicles through which VLS could make good use of public relations and pursue its objective. The ones we retained are press releases, feature stories and publicity.

¹⁴ Note: Some states have fiscal years that beginning as early as July and do not conform to the federal one.

Press releases increase public awareness of a firm's brand due to its credible nature. VLS could take advantage of free press coverage because I believe that the company will have enough items to make good news stories such as their new products or their strategic alliances with key partners. In addition, VLS should send information to a medical imaging trade journal regarding its new product to be posted in the free product announcement section.

While it is not possible for VLS to know if or when an article will appear in the media, it can invite journalists to do an exclusive story about its new product and strategic alliances. In fact, this is the communication vehicle that we recommend for the preannouncement.

ii. Direct mail

Direct mail communicates and attempts to create transactions by sending printed materials to the target market. What make this medium appealing in our case is its selective nature and its ease for effectiveness measurement. A mailing list can be obtained from our OEM partners since we share the same clients. Given that the replacement cycle of medical imaging equipment is about 8 to 10 years, the list should include mailing information from customers who bought CT scanner within the 10 last years. A correspondence should be sent to those prospects which will include a brochure and an introduction letter. Brochures should contain the following information:

- Features and benefits of the product with the details provided in this document regarding the cost-saving benefits and ROI
- Technical information about the software
- Contact information including web site address where the client can go to download the software for a 30-day-free-trial or request a copy of the software for a 30-day-free-trial
- Partners contact information

The free trial version of the software should require the customer to register online so that VLS can build a marketing database to track their customers. Building marketing database is important for managing customer relationships. It should be used to identify the most

valuable costumers over time, and increase customer loyalty by providing customized products and services.

The budget for the direct mail is summarized in Table 14. It is a relatively costly marketing tool which CPM (cost per contact) is \$2,004.8 against \$230 for an insertion of a full page in Diagnostic Imaging. However, a sensitivity analysis would show that a single unit needs to be sold to amortize this investment. It is however a very efficient tool with wasted coverage almost null.

Table 14: Direct Mail Budget for 2,500 Catalogs

Items	Prices
Catalogs (2,500)*	\$ 1,246.50
Envelopes 9 X 12**	\$ 648.00
Design fee***	\$ 1,500.00
First-class mail (.32 lb, flat size for 1,750 units)	\$ 2,425.50
List (from partner)	\$ -
Total	\$ 5,820.00

*4 color 8-1/2 x 11 catalog with aqueous coating on front and back cover @ <http://www.printingforless.com>

**Jam Paper Online @ <http://www.jampaper.com>

***Estimation

iii. Sale promotion

After the trial period, an offer should be made to the prospect. An incentive of \$1,425 (5 percent off) after mail-in-rebate should allow VLS to obtain initial distribution. The advantage of the mail-in-rebate is that it protects VLS against gray markets while banking on consumers not collecting.

iv. Trade shows and trainings

Trade shows are often recommended for small businesses that cannot afford advertising. They are a very important route for reaching potential customers and partners especially in the B2B context. It is also a good way to make contact with existing clients which interactions are also referred to as “the moment of truth.” They are good opportunities to reinforce the image of the company. We also recommend that a brochure be given to

potential clients so that they can give supporting details about the product when reporting their findings.

Trainings allow companies to embellish their offer and contribute to decrease the FUD factor of customers of high-tech products. It should be a lucrative source of revenue for VLS. Once VLS reaches an acceptable rate of diffusion of its new product, it should slowly migrate toward offering more services to gain profitability by offering a more diverse range of services.

Table 15: Trainings Pricing Table

Training	Price
On site training	\$ 995.00
Online training	\$ 195.00
Seminar registration fee	\$ 50.00

v. Internet

VLS's web site should be redesigned to integrate information about the new software and the company. It will have to be regularly updated in order to give good impression to the customers and partners. The Internet should be used to reach 5 objectives:

- Promote and enhance information sharing by provide detail information about the product as well as systems requirements;
- Demonstrate the accuracy and cost-saving benefits respectively through a case study example illustrated with pictures and a java applet program computing ROI based on clients' input;
- Purchase the product and download upgrades, updates or the product itself in order to speed up the time of acquisition as well as reduce VLS's operating cost;
- Enhance partner's relationships using Internet capabilities to leverage collaborative planning so that different members of the supply chain can view each others' inventory levels;
- E-mail communication including permission marketing, content interest to site visitor and contact information of the company.

VLS should also work in promoting its web site. Directing potential customers to the web site is capital in reaching our marketing objective. It should allow VLS to communicate the benefits of the product through the java applet program as its relative advantage is not physically observable.

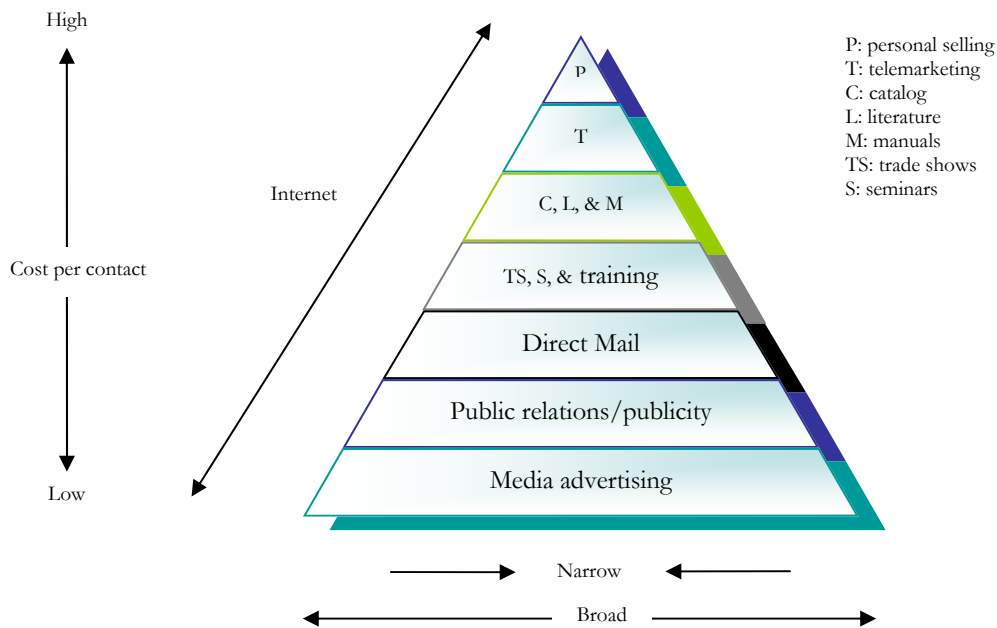
A search engine positioning using VLS as keyword has been performed and gave the following results:

Table 16: Search Engine Positioning Using Keyword VLS

Search Engine	Rankings
Google	7
Yahoo	83
AOL	13
MSN	71

A second search has been carried out using this time the keyword GIS software. For this study, none of the search engine in Table 16 has resulted in a ranking less than 100. From this study, we suggest that an analysis of the log files of VLS web site be done in order to collect useful information about users. This will allow VLS to effectively position their web sites to appear in search engine rankings in order to gain maximum visibility. The effectiveness of the web site should also be measured.

Figure 6: Advertising and Promotion Pyramid¹⁵



4. Distribution

The hybrid channel is the type of distribution channel that will be appropriate to the business model chosen for VLS’s new software. The objectives of a hybrid channel are to increase market coverage while maintaining cost efficiency¹⁶. Still, VLS’s distribution channel for its new product must heavily rely on strategic alliances and partnerships with key players of the medical imaging industry.

a. Partnerships and alliances

The success of VLS new product will depend on its ability in building key and strategic relationships with the industry players.

¹⁵ Source: Adapted from Ames, B. Charles and James D. Hlavacek (1984), *Managerial Marketing for Industrial Firms*, NY: Random House, p.253

¹⁶ Source: Jakki Mohr (2004), *Marketing of High-Technology Products and Innovations*, (New Jersey: Pearson Education), p.289

First, alliances with major OEM are relevant as they will permit to address compatibility problems given the number of platforms in the diagnostic equipment industry and the complexity of the radiology field. To some extent, GE Healthcare, Philips Medical Systems and Siemens Medical Solutions develop software to provide complete solution to their customers. Still, they do not possess the level of sophistication that VLS could deliver to the marketplace. Ideally, we would recommend an alliance with Siemens. However, a higher risk of being “amazoned” could be encountered if VLS were to establish strategic alliances with any of those firms. Even when big names such as Siemens are still open to agreements, they select top partners which reputation usually goes beyond the medical imaging industry. VLS, being new in the industry does not have any reference. Thus, a partnership with smaller business entity like Toshiba Medical Systems would be a more realistic and achievable goal. Toshiba, whose reputation is undeniable, would benefit more from this type of alliance than one of the “Big 3”. During their period of consolidation, the “Big 3” manufacturers have all acquired IT companies to reinforce their strategic position on the marketplace. Toshiba Medical System may not have a big market share in the medical imaging industry. However, its revenue is growing twice faster than any of the “big 3” manufacturers.

Secondly, alliances with hospitals and universities are highly recommended as they can create good PR if the product is a success. VLS should provide training at no cost for those institutions to fully test VLS product. The Mayo Clinic which began operating the first CT instrument in the U.S. in 1973 is our first choice for implementing an “influence the influencers” program which in return will generate favorable word of month. The second choice is Massachusetts General Hospital. If those partners do not have Toshiba scanners, it would more suitable to work with hospitals that already have a partnership with Toshiba Medical Systems.

Thirdly, it is also critical for VLS to carefully develop relationships with editors from publications to effectively manage its press release program given the uncontrollable nature of press releases. For instance, Frost & Sullivan has been a ubiquitous source of information for vendors, hospitals and imaging centers. I suggest VLS to develop cautiously relationships with Frost & Sullivan.

Finally, alliances with financial institutions such as CitiFinancial and AmeriCapital should allow smaller healthcare facilities to deal with financing issues.

Table 17: VLS's Partners Selection

Partners Selected		Reasons	VLS Offer
OEM	Toshiba	Reputation, strong influence in CT segment, strong growth, open door to Asian market	Complete solution
	Siemens	Reputation, size of market share, favorable to agreements & alliances vs. acquisition	Complete solution
Hospitals	Mayor Clinic	Reputation, rank 19 in RT Image's 25 Most Influential	Free products & free training
	Massachusetts Gen. Hospital	Rank 16 in RT Image's 25 Most Influential	Free products & free training
Research	University of Michigan	Rank 10 in RT Image's 25 Most Influential & 11 in US News & World Reports "Best Hospitals"	Free products & free training
Institutions	Johns Hopkins University	Toshiba partner, rank #4 in RT Image's 25 Most Influential	Free products & free training
Financial	CitiFinancial	Operate in healthcare sector	Additional income
Institutions	AmeriCapital	Operate in healthcare sector	Additional income
Media	Frost & Sullivan	Leader in cover news & facts in medical imaging	Relevant facts or news

Gen. = General

b. Direct channel

The purpose of the direct component of VLS channel distribution is not only to increase market coverage but also enrich Toshiba's customers experience with the product in order to increase brand loyalty given the low repeat rate of CT scanners. It is a strategy which would not be appropriate if a wider distribution network was needed. It will essentially serve Toshiba Medical Systems' clients who possess CT scanners acquired prior the alliance VLS-Toshiba. Those clients represent an important size of our target market as shown in Table 18 below. We favor the direct channel as it allows VLS to own and build relationship with end users which it already does with its current value chain for Feature Analyst®.

Table 18: Number of CT Scanners Sold and in Operation, 2002-2007

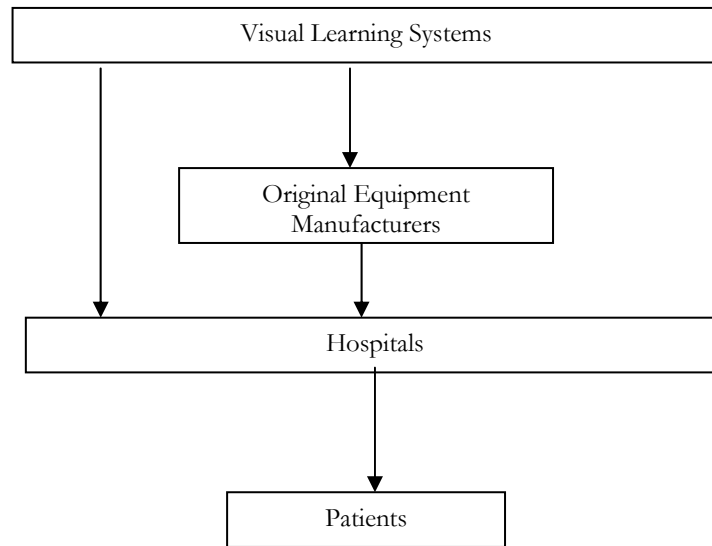
	2002	2003	2004	2005	2006	2007
New CT Scanners Sold	683	744	810	882	961	1,046
Existing Scanners	14,000	14,683	15,427	16,237	17,119	18,080
Total Scanners	14,683	15,427	16,237	17,119	18,080	19,126
New CT Scanners Sold by Toshiba	68	74	81	88	96	105
Existing Scanners by Toshiba	1,400	1,474	1,555	1,644	1,740	1,844
Total Scanners by Toshiba	1,468	1,549	1,636	1,732	1,836	1,949

Note: We assumed a 8.9% growth rate instead of a higher rate to account for the 22.5% growth rate of Toshiba's annual revenue and the number of scanners out of service

c. Indirect channel

The objective of the indirect channel differs from the direct one in that it is directed toward potential clients for CT scanners. The indirect channel is intended to design a more compelling offer for hospitals and diagnostic centers by implementing a bundling strategy. The bundling strategy will insure some flexibility for VLS in fixing its prices while increasing the demand for both products through a perceived synergy between the products offered. Thus, VLS software will be available as part of Toshiba solutions packages, so that customers can purchase all system accessories necessary for specific imaging application from a single source. This can be referred as today's best practice marketing with companies like Siemens Medical Solutions taking the lead. Its recent agreements with respectively Medrad, Inc. and Agfa Healthcare reflect Siemens engagement to deliver full products to its customers as depicted in the following statement: "Siemens is committed to providing its customers with complete solutions, which includes not only advanced imaging systems and information technology capabilities, but also the required accessories."

Figure 7: VLS Supply Chain for the Medical Imaging Software



To avoid any conflict with Toshiba Medical Systems, VLS have to keep the price of the direct channel aligned with the indirect channel. Meanwhile, financial arrangements need to be made to compensate Toshiba for its training and sales contributions. We recommend that 10 percent on the sale generated from the indirect distribution channel be given to Toshiba.

5. Personnel

The personnel are an important component for the success of VLS in the new medical imaging market. In particular, VLS needs to reinforce its R&D team to be able to launch the new product within an appropriate time limit. Timing is critical in an environment where the emergence of new technologies is very common. That is the reason why we recommend that the prototype be ready after 5 months of intense research (beginning of June) to test market in local hospitals. After adjustments have been made, we plan the release of the final product 2 months later (late July) which should be available for our partners among both research institutions and health facilities. Finally, the official release should be expected a

month later (beginning of September) which should give enough time to the potential client to test it before the beginning of the new fiscal year (FY 2005).

It is important that the personnel from R&D and marketing interact during the early stage of the product development. It will allow them to determine with more precision the official date for launching software. This right date has to be known for the preannouncement in order to avoid damaging the reputation of the company. Moreover, it plays a capital role in the diffusion of market and customer market among all the members of the project. The promises of the R&D-marketing collaboration can be achieved if a spirit of co-optation, cooperation, communication, constructive conflict and a caveat prevails.

Another relevant aspect of the personnel is the training. The partnership with Toshiba should provide VLS with the adequate training to understand the subtleties of radiology field. Below (Table 19), we propose the following budget for R&D expenditure. In case the budget will not suffice to reach the objective, I recommend VLS to submit an online-paid-request directed to anyone who would have the solution to the given problem.

Table 19: Additional R&D Expenditure for VLS New Software

R&D Expenditure	Cost	Units	Total
<i>Diagnostic imaging Technologist</i>	\$ 52,000	1	\$ 52,000
<i>Customer Support Specialist</i>	\$ 44,000	1	\$ 44,000
<i>Market research Analyst</i>	\$ 61,000	1	\$ 61,000
<i>Programers</i>	\$ 65,000	2	\$ 130,000
<i>Software engineers</i>	\$ 70,000	2	\$ 140,000
Total expenses			\$ 427,000

Source: <http://hotjobs.yahoo.com> for salaries

C. RESULTS AND LIMITATIONS

1. Results

Table 20: Projection of Revenue Generated from the Sale of VLS Software, 2005-2007

(Partners)	2005***** (Toshiba)	2006 (Toshiba)	2007 (Toshiba)
Direct mail expenses, 4 per year (US market)	\$ 5,681.40	\$ 22,725.60	\$ 22,725.60
PR expenses	\$ 5,000.00	\$ 6,500.00	\$ 7,800.00
PR & Trade Shows expenses (US market)	\$ 5,000.00	\$ 20,000.00	\$ 20,000.00
R&D staff expenses (US market)	\$ 427,000.00	\$ 433,405.00	\$ 439,906.08
Web site redesign & related expenses	\$ 25,000.00	\$ 10,000.00	\$ 10,000.00
Diagnostic Imaging subscription	\$ 113.00	\$ 113.00	\$ 113.00
Toll free service	\$ 299.97	\$ 1,199.88	\$ 1,199.88
Commissions on sales generated by Toshiba (10%)^	\$ -	\$ 138,720.00	\$ 228,310.00
Sale promotion expenses (US market)	\$ 37,570.00	\$ -	\$ -
Misc. expenses (US market)	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00
Total Expenses (US market)	\$ 510,664.37	\$ 637,663.48	\$ 735,054.56
Total Expenses (Foreign market)	\$ -	\$ -	\$ -
Number of product sold (US market)	26	165	352
Product sales revenue (US market)	\$ 751,400.00	\$ 4,768,500.00	\$ 10,172,800.00
Licence sales revenue (US market)	\$ -	\$ 260,000.00	\$ 191,000.00
Training revenue (US market)	\$ 5,970.00	\$ 40,795.00	\$ 87,560.00
Online training revenue (US market)*	\$ 3,900.00	\$ 24,180.00	\$ 51,480.00
Seminars (US market)	\$ -	\$ -	\$ 5,000.00
Customization contract revenue (US market)**	\$ 18,000.00	\$ 102,000.00	\$ 210,000.00
Consulting contract revenue (US market)***	\$ 10,000.00	\$ 80,000.00	\$ 180,000.00
Revenue from sale promotion not claimed (US market)****	\$ 18,785.00	\$ -	\$ -
Total Revenue (US market)	\$ 808,055.00	\$ 5,275,475.00	\$ 10,897,840.00
Total Revenue (Foreign market)	\$ -	\$ -	\$ -
Profit	\$ 297,390.63	\$ 4,637,811.52	\$ 10,162,785.45

*We assumed that 75% of trainings are done online

**We assumed that 10% of the customers need a customized product

***We assumed that 1/20 will ask for this service

****We assumed that 50% of customers will forget to claim their rebate which rate is higher in business-to-consumer context

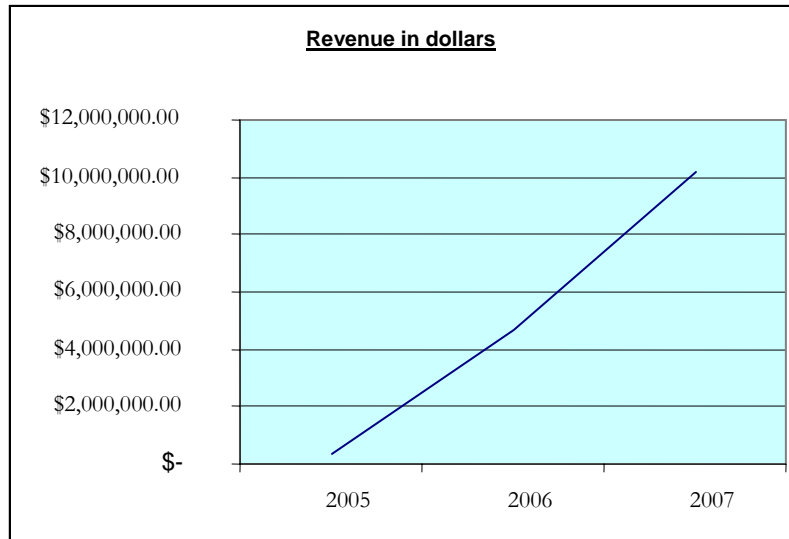
*****3 months only

^We assumed that Toshiba sold the software to 50% and 75% of customers who bought new scanners respectively in 2006 & 2007

The results in Table 20 have been obtained from consideration made in previous sections. However, additional assumptions have been made to be able to do some projections on VLS's sales which we based on John Philip Jones research. His study which has been done

using single-source data generated by ACNielsen¹⁷ suggests that a 1 percent increase in advertising (here PR and trade shows) yields just a .2 percent sales increase on average. Furthermore, we assumed independently that every direct mail generates a rate of response between 1 percent and 2 percent (here we chose 1.5 percent).

Figure 8: Projection of Revenue from the New Software Sales



The graph in Figure 8 shows that the introduction of new product would very lucrative for VLS. We intentionally did not include results for the sales made abroad which is based on the same reasoning and might involve more expenses for the company.

2. Limitations

According to the results, entering the medical imaging market is without any doubt an attractive business for VLS. However, I would recommend an stronger and deeper analysis using more advanced statistical tools for estimating the data on which the results are based on. In fact, the use of secondary data does not always lead to correct answers as the purpose for which they have been collected – which might be different from ours - often determine

¹⁷ John Philip Jones (1995), *When Ads Work*, (New York: Lexington Books)

their validity for the context there are being used. In addition, some data used do not provide a representative sample. Thus, to better assess whether VLS should penetrate the new market, surveys and customer visit program would a more adequate solution.

It is also important to mention that due to the unavailability of important data and information from VLS such as financial resources, marketing and sale objectives, we were not able to tailor our objective to fit the one of the company as well as its capabilities.

Finally, the success of VLS in the medical imaging market strongly depend on its ability of building strong and key relationships with players in the industry. The outcome will be a function of the trust and perception that potential partners will have of the company. Thus, it important that VLS take in early consideration some marketing suggestions mentioned in this rapport while integrating potential partners' core values. Meanwhile, it remains important that VLS capture eventual piracy and privacy issues as well as the risk involved in partnering which can result in a loss of autonomy and trade secrets.

APPENDIX

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 - <http://www.ctimi.com/>
 - <http://www.hologic.com/>
 - <http://www.kodak.com/>

LIST OF COMPETITORS IN THE MEDICAL IMAGING MARKET

1. Agfa-Gevaert⁺
2. Air Techniques⁺
3. Analogic Corporation
4. Bio-Rad Laboratories⁺
5. Boston Scientific⁺
6. Canon Incorporated⁺
7. Cooper Companies (CooperSurgical)
8. CTI Molecular Imaging
9. Danaher Corporation (Gender Dental)
10. Del Global Technologies
11. Eastman Kodak Company
12. Fisher Imaging
13. FONAR Corporation
14. Fuji Photo Film Company (Fudji Medical Systems USA)
15. General Electric Company (GE Heathcare)
16. Hitachi Limited
17. Hologic, Inc.
18. Intermagnetics General
19. Royal Philips Electronics (Philips Medical Systems)
20. Schick Technologies, Inc.
21. Shimadzu Corporation
22. Siemens (Siemens Medical Solutions USA)
23. Sonosite Incorporated
24. Swissray International

⁺Companies not involved in medical imaging equipment manufacturing such as scanners

25. Toshiba Corporation
26. Tyco International (Mallinckrodt) ⁺
27. Varian Medical Systems

⁺Companies not involved in medical imaging equipment manufacturing such as scanners

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- **Frost & Sullivan**
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San Antonio, TX 78229-5616
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Fax: (888) 690-3329

- **John Hopkins Medicine**
720 Rutland Ave.
Baltimore, MD 21205
Phone: (410) 955-5000

- **Massachusetts General Hospital**
Phone: (617) 726-1798
Fax: (617) 724-0264

- **Mayo Clinic**
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Tustin, California

Phone: (800) 421-1968

○ **University of Michigan Medical School**

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PHOTOS

Figure 9: CT/Aquilion 16, Toshiba



Figure 10: CT/Somatom Sensation Cardiac 64, Siemens



Figure 11: MR/07T Signa OpenSpeed Excite, GE

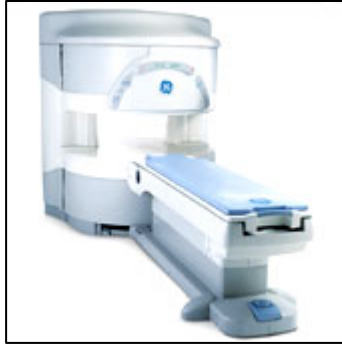


Figure 12: Ultrasound/HDI 4000, Philips

