

ECHOCARDIOGRAPHY.ORG

by
Terence D. Rafferty

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**THE UNIVERSITY OF NEW HAVEN
EXECUTIVE MBA PROGRAM**

ECHOCARDIOGRAPHY.ORG

By

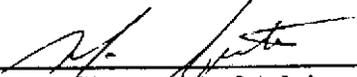
Terence D. Rafferty

1999

**An independent study submitted in partial
fulfillment of the requirements for**

**MASTER OF BUSINESS ADMINISTRATION
EXECUTIVE MBA PROGRAM**

Executive MBA Study Advisor: Moshe Speter



Signature of Advisor

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ECHOCARDIOGRAPHY.ORG

Terence Rafferty, President

17 East Wharf Road
Madison, CT 06443
(203) 245-2613

Mel Linzer, Chief Operating Officer

2 Fulham Court
Silver Spring, MD 20902
(301) 649-3447

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TABLE OF CONTENTS

VISION STATEMENT	4
MISSION STATEMENT	4
EXECUTIVE SUMMARY	4
SECTION 1.	
A. THE BUSINESS	5
B. TRANSESOPHAGEAL ECHOCARDIOGRAPHY	5
C. PRODUCT DESCRIPTION	6
D. THE MARKET	6
E. COMPANY GOALS	7
SECTION 2	
A. EXTERNAL ENVIRONMENT	8
B. TASK ENVIRONMENT	9
C. INTERNAL ENVIRONMENT	11
SECTION 3.	
A. STRENGTHS AND WEAKNESSES	14
B. OPPORTUNITIES AND THREATS	15
SECTION 4.	
A. ACTION PLAN	17
B. RESULTS	19
C. ANALYSIS	21
SECTION 4.	
A. FUTURE DIRECTION	24
B. RESEARCH AND DEVELOPMENT	24
C. OPERATIONAL EFFICIENCY	24
D. MARKETING STRATEGY	25
E. FUTURE RISKS	26
F. SUMMARY	27
G. LESSONS LEARNED	28
SOURCES	29-37
APPENDICES	38-47

VISION

To be viewed as a pacesetter in multimedia (medical) education.

MISSION

To link development of a unique expertise in interpreting consumer wants and needs, through author involvement in the full spectrum of publishing activities, with production of compelling and innovative “before-their-time” products for TEE monitoring.

EXECUTIVE SUMMARY

Echocardiography.org is a multimedia publishing company which was founded in 1998 to meet a consumer demand for education in the field of transesophageal echocardiography. Transesophageal echocardiography (TEE) is an ultrasound diagnostic technique for obtaining real-time images of the heart and great vessels from a transducer positioned within the esophagus. This technique receives widespread application in the perioperative care of critically ill patients.

The company has two divisions, namely, a research unit based in New Haven, Connecticut, and a production and distribution unit based in Silver Spring, Maryland. The company product consists of 6 hours of videotape and a book which describe TEE techniques. The target market consists of physicians who wish to develop or maintain expertise in TEE.

Initial company efforts have focused on developing a product, and determining the logistics of test marketing and distributing the product to a market niche of cardiac anesthesiologists, a subset of consumers who would be expected to be particularly receptive to the product. Promotional methods included selective mass mailings, lecture promotion, and Internet marketing. Test marketing of the product resulted in 99 sales of complete videotape sets in 6 months of operations. Most purchases were made by groups of physicians, rather than by individual physicians, a factor which necessitated downward revision of the size of the residual market. This suggested that efforts be made to expand the size of the potential market by also targeting both non-cardiac anesthesiologists and physicians from subspecialties other than anesthesiology. A second focus of test marketing had been to determine an optimal price for the videotapes. Results suggested that price was not a major purchasing variable, and that it would be reasonable to set the price for subsequent marketing at, or above, the price previously demanded. Finally, despite the small number of sales involved, the distribution channel for the videotapes did not function seamlessly, and requires further attention.

Projected plans for the future include placing a major emphasis on Internet marketing from established e-commerce sites, both in the US and overseas, and annual release of product upgrades to reflect consumer needs, as determined by feedback from a database of existing consumers, and further development of an existing public service Internet web site, also termed Echocardiography.org.

SECTION 1.

A. THE BUSINESS

Echocardiography.org is a start-up company which was established in 1998 to meet a demand for education in the field of transesophageal echocardiography (TEE). TEE is a medical diagnostic and monitoring technique which uses ultrasound to obtain real time images of the heart from a transducer which is positioned within the esophagus.

Echocardiography.org markets educational videotapes to physicians who wish to acquire expertise in TEE. The company intends to gain a competitive edge in the industry by targeting a market niche of anesthesiologists who wish to utilize TEE in a perioperative setting. The strategy to maintain a competitive advantage in the field consists of the continued development of further generations of innovative videotapes focused on market research-driven topics.

The company has two divisions, namely a research unit based in New Haven, Connecticut, and a production and distribution unit located in Silver Spring, Maryland. Marketing media include mass mailing, presentations trade show exhibits, and Internet promotions.

B. TRANSESOPHAGEAL ECHOCARDIOGRAPHY

To obtain TEE images, a probe with an ultrasound transducer-containing tip is placed into the esophagus via the mouth. It is then advanced until it lies directly behind the heart. From this position, the ultrasound beam emitted from the transducer can then provide continuously available images of the beating heart.

While TEE has been available to medical practitioners since the early 1980's, early use of the technique was restricted to research, rather than a clinical setting. This initial limited application of TEE was due to the poor image quality of the early imaging systems, as well as to a lack of recognition that TEE data could be useful for patient care. Subsequent technological advances have markedly improved the image quality, and clinical studies have validated the clinical usefulness of TEE data for guiding patient management. These changes have led to increasing application of TEE to clinical care.

Numerous authorities have emphasized that the operator of a TEE imaging system must possess considerable expertise to avoid the possibility of furnishing false or misleading data. This has resulted in the development of a TEE education industry involving publication of books, videotapes and CD-ROM's on the topic. Indeed, Amazon.com, the electronic bookstore, have recently established a web page specifically devoted to TEE publications. In addition, the National Board of Echocardiography has recently developed a TEE Board Certification test for physicians. A perception that physicians might soon be expected to possess TEE Board Certification in order to practice TEE would be expected to further augment demand for TEE educational materials.

C. PRODUCT DESCRIPTION

The product consists of a videotape series on perioperative use of TEE. This videotape series is entitled *Video Seminars in Intraoperative TEE*. The videotapes provide 5 hours and 44 minutes of viewing. Each tape is accompanied by an article providing technical detail.

The author of the videotapes, Terence Rafferty, MD, Professor of Anesthesiology and Director of Cardiac Anesthesia at Yale University School of Medicine, is a leading authority on intraoperative TEE. He is the author of over sixty publications and two textbooks on TEE. A well recognized educator, he has lectured widely on TEE, both in the US and abroad, and has given workshops on the topic at the Annual Meeting of the Society of Cardiovascular Anesthesiologists and the Royal College of Anesthetists.

The subject material of the videotapes consists of the following: 1) A description of a patient examination sequence specifically designed for beginning practitioners (two videotapes with running times of 42 and 34 minutes, respectively); 2) A self-evaluation test featuring both normal and abnormal findings (one videotape with a running time of 34 minutes); 3) A description of evaluation of the mitral valve (two videotapes with running times of 110 and 62 minutes, respectively); 4) A presentation of findings derived during total hip replacement (one videotape with a running time of 25 minutes); 5) A description of intensive care application of TEE (one videotape with a running time of 25 minutes).

A pre-publication review of the videotape series by George Lighty, MD, Editor of the *Video Journal of Echocardiography*, has provided the following comment: *This is an extraordinary series. The material is lucidly presented, with superb images and graphics. In particular, the detailed print articles and three hours of video on the mitral valve provide a comprehensive tutorial/review that is unparalleled in the field.* This review appears in promotional materials.

D. THE MARKET

The target market of the company consists of anesthesiologists in the US who wish, or have been required, to acquire expertise in TEE. The majority of US anesthesiologists are members of the American Society of Anesthesiologists (ASA). The ASA has 35,000 members. Thus, the total potential market size consists of 35,000 prospects.

This market niche can be further subdivided by area of particular interest and/or expertise. A 5,800 person sub-set of US anesthesia personnel are also members of the Society of Cardiovascular Anesthesiologists (SCA). The SCA has been particularly active in promoting the use of TEE as an adjunct to clinical management of critically ill patients. Thus, members of the SCA would be expected to be particularly receptive to marketing of TEE educational materials marketing. For this reason, initial marketing and market research has, hitherto, been focused on this 5,800 strong sub-group of the target market.

E. COMPANY GOALS

1. To develop a multimedia reference source of descriptions of TEE patient examination sequences suitable for use by beginning practitioners;
2. To develop a multimedia reference source of TEE findings in commonly-encountered perioperative disease states;
3. To gain an understanding of the TEE videotape market in a market niche of anesthesiologists;
4. To achieve the financial objective of the venture capital partner (M.L.) in the company, namely, a sales revenue break-even point, exclusive of author opportunity costs, within 12 months of implementation of a test marketing action plan.

SECTION 2

A. EXTERNAL ENVIRONMENT

Societal forces

- a) TEE has become increasingly applied to perioperative management of critically ill patients;
- b) Results of a 1995 survey of 98 anesthesiology residency programs in the US which utilize TEE indicate that anesthesiologists, rather than cardiologists, are responsible for interpretation of TEE data in more than half of these programs. The majority of these anesthesiologists have had no formal residency or fellowship training in the use of TEE.

Economic forces

While the overall US economy is strong, the evolution of managed care has resulted in marked changes in the healthcare market. Faced with decreased remuneration for services, most medical centers and physicians are in the process of downsizing. Budgets for such “non essential” items as continuing medical education are also undergoing drastic downward revisions. Anesthesiologists are not immune from these economic forces.

The standard means of acquiring TEE skills include attendance at large scale conferences featuring guest speakers who are experts in the field. Attendance at these conferences requires a financial outlay for registration fees, hotel and transportation, with amounts in the order of \$1,800. The videotapes offer a means of acquiring TEE education in a more cost effective manner, with the added advantage that the tapes can be viewed over and over again in the comfort of one's own home.

Technological forces

- a) The field of anesthesiology has always been a technology oriented specialty, and anesthesiologists have always been required to continually improve their techniques in order to maintain a competitive edge in their field;
- b) The field of electronic communication is rapidly evolving. This is evidenced by the exponential growth of the Internet, where it has been estimated that a new network is developed every 10 minutes. Presently available technology includes user-friendly software for ready construction of Internet web sites, and such secondary products as CD-ROM's, by individuals without specific expertise in this area. These technological advances will undoubtedly impact on all educational fields, including TEE education.

Regulatory forces

- a) At the present time, physicians are allowed to practice TEE without having undergone specific training in this field. However, the National Board of Echocardiography has recently developed a certification test in TEE. Historically, the provision of Board Certification status to a medical sub-specialty is usually followed by national regulations which make it difficult for non-Board Certified physicians to obtain hospital privileges in the particular sub-specialty in question;
- b) It seems reasonable to speculate that insurance carriers may ultimately reduce payment for TEE services provided by non-Board Certified physicians. Should either/both circumstances occur, it is likely that anesthesiologists will search for TEE test preparation products to increase their likelihood of achieving a passing grade in the TEE Board Certification test.

Sociocultural forces

- a) Most persons prefer to learn TEE by viewing moving TEE images, rather than by simply reading about TEE in a book;
- b) The present US culture favors aggressive medical care of all patients, including critically ill and aged populations;
- c) Physicians have always been unyielding in their drive toward application of new technology to medical care.

B. TASK ENVIRONMENT

Stockholders

The company consists of a partnership between Terence Rafferty, the author of the videotape seminar series, and Mel Linzer, the venture capitalist responsible for manufacturing, marketing and distribution of the videotapes. The partners have agreed to a 50:50 distribution of pre-tax profits. There are no formal written contracts.

The copyright for the videotapes is held by Mel Linzer. Terms for a buy-sell agreement for transfer of copyright ownership, in the event that one of the partners might wish to secede from the partnership, have not been discussed.

Federal Government

Patient confidentiality has been maintained by masking out patient name and identification on the videotape segments.

Yale University

- a) Writings and related material by Yale Faculty have been traditionally considered to be the intellectual property of the author. The Yale University Copyright Policy, as published by the University Office of Cooperative Research, states that the University disclaims ownership of works by faculty, staff, postdoctoral fellows and postdoctoral associates and students, whether in traditional or non-traditional forms.

This provision is not applicable when copyrighted materials are developed in the course of sponsored research pursuant to an agreement approved by the Office of Grant and Contracts, and when a copyrighted work can also be patented. It may also not be applicable under the special circumstances where the Provost of the University has deemed that the University has made an unusual commitment of resources to a project. However, these exclusionary conditions are not applicable to this videotape series;

- b) A standing letter validating the acquisition and use of patient monitoring data obtained during routine clinical care by Terence Rafferty has been in the files of the Yale University School of Medicine Human Investigation Committee since 1982;
- c) Yale University Human Investigation Committee and the Mount Sinai School of Medicine Investigation Review Board permission to perform standardized testing of Yale and Mount Sinai anesthesiology residents interpretive skills, a topic of one videotape, is also on file at these respective medical schools.

Special interest groups

Five of the videotapes were prepared as cooperative projects. In academic publishing, submitted materials assign copyright to the publishing entity, and all contributors have assigned copyright rights to the publisher. This precludes subsequent claims of person(s) who perceive themselves as wayward or forgotten founders of the company.

Notwithstanding, it would seem proper and prudent that attribution be given to contributors, particularly since at least two of the contributors practice in an academic environment. This attribution would provide them with increased name recognition and the ability to note the appropriate citation on their curriculum vitae.

Creditors

At present, there are no creditors. Possible future creditors (depending on sales volume) include the following: a) Videotape suppliers; b) Marketing sub-contractors; c) Packaging and distribution sub-contractors; d) Videotape copying services; e) Mass mailing coordination services; f) Customer relations support services.

Suppliers

The required production raw materials consist of videotapes, labels, and hard copy articles. These materials are purchased as required. Blank videotapes are generic products, and the labels on the outer casing of the videotapes have a relatively simplistic design. This feature allows the flexibility for ready recruitment of additional suppliers of these items should demand exceeded production capacity. Similarly, the hard copy articles which accompanied the videotapes can also be printed by a variety of vendors should the necessity arise.

Community

There is no possibility of patient lawsuits from application of the techniques outlined in the videotapes. The educational materials have already undergone peer review in hard copy journals. In addition, the materials has also been published in two textbooks, edited and co-edited, respectively, by Terence Rafferty. The videotapes themselves have received continuing medical education (CME) credit accreditation by Hahnemann University School of Medicine prior to their publication as original articles in the Video Journal of Echocardiography.

Competitors

The competition consists of other commercially-available TEE educational videotapes and CD-ROM's. Major videotape competitors consist of the American College of Cardiology, the Mayo Clinic and the Texas Heart Institute. while major CD-ROM competitors consist of the American College of Cardiology, Churchill Livingstone, Inc., Springer Verlag, Inc. and Bristolcone, Inc. The competing products of these organizations will be analyzed in the "Company strengths and weaknesses" section of this business plan.

Substitute products

Laser discs provide a further full-motion communication medium. However, this medium has largely been superseded by CD-ROM technology. Available laser discs on TEE consist of offerings by Advanced Technology Laboratories, Inc. (ATL) and Image Premastering Services, Inc., respectively. The ATL laser disc features only normal findings. This laser disc was intended to be the forerunner of a complimentary laser disc describing abnormal findings. However, further development of the series was halted when the company devolved its echocardiography subsidiary from the parent company. The Image Premastering Services laser disc suffered a similar fate. This company has recently undergone bankruptcy proceedings, and the laser disc is now marketed by CV Mosby company. Despite being commercially available since 1992, only 200 copies of this laser disc have been sold to date.

While the Internet will, undoubtedly, become a major medium for dissemination of TEE education, bandwidth constraints have, hitherto, precluded the use of this medium for portraying high quality, long duration, full-motion imaging sequences. Acuson®, a commercial manufacturer of TEE equipment, does maintain an echocardiography web site. However, this web site only features still-frame images, rather than full-motion imaging sequences. In addition, the web site is clearly a marketing site for the company, rather than a bone-fide teaching site. A number of academicians, including the author of the videotape series, also maintain echocardiography web sites. Again, these sites only contain either still-frame images or looped imaging sequences.

A further substitute product consists of audiotapes and videotapes of the lectures from annual intraoperative echocardiography courses provided by the Society of Cardiovascular Anesthesiologists. These live recordings are commercially marketed by a company termed "CME Unlimited". Again, these products do not feature full-motion, long-duration imaging sequences. In addition, the original lecture schedule from which these videotapes are derived do not feature a logical progression from simple to complicated topics. Rather, the order of the videotape and audiotape lectures are as they were originally scheduled, with, on occasion, up to three lectures of varying complexity on one videotape.

C. INTERNAL ENVIRONMENT

Managerial structure

The President of the company is Terence Rafferty and the Chief Operating Officer is Mel Linzer. The company has no employees and contracts only with independent contractors. Terence Rafferty, Professor of Anesthesiology and Director of Cardiac Anesthesia at Yale University School of Medicine, is a former Director of the Yale Intraoperative TEE Service and a member of the Editorial Board of the Video Journal of Echocardiography. He is Board Certified in both Anesthesiology and Perioperative TEE. Mel Linzer is the founder, co-owner and the executive editor of eleven videotape journals, including the Video Journal of Echocardiography and the Video Journal of Color Flow Imaging, respectively.

Culture

The organization has an entrepreneurial focus. Both partners are task-completion oriented and experienced in their respective fields.

Quality reputation

The product has already been marketed to cardiologists and radiologists in the form of individual videotape journal articles. The production process for this market segment involved pre-publication review by experts in the field of echocardiography, pre-publication accreditation by the Hahnemann University Continuing Medical Education Review Board, and consumer feedback. Peer reviews by the target niche of cardiologists and radiologists have been positive.

Internet marketing

Internet marketing was performed using a customized web page hyperlinked to a TEE education web site located on a Yale University server. The marketing web page contains no reference to pricing, a precondition of using a non-profit status organization as a host. However, Yale University does permit the inclusion of the publisher telephone, fax and E-mail numbers in promotional materials, and these data are contained in the marketing web page.

The TEE education web site to which the marketing web page is linked consists of a book chapter (Rafferty, T: Transesophageal Echocardiography Tutorials) in an Internet textbook termed "The Global Textbook of Anesthesiology: <http://www.gasnet.med.yale.edu>. This Internet book chapter has two domain names, namely, <http://www.echocardiography.org/> and <http://gasnet.med.yale.edu/reference/echomanual/index/>. The Internet book chapter can also be accessed from the Internet search engines, Infoseek and Metacrawler by using a Boolean logic descriptor search (transesophageal echocardiography +Rafferty).

Projected budget

The projected budget flowed from the marketing strategy. This strategy involved mass mailing of promotional materials using the mailing lists of the Society of Cardiovascular Anesthesiologists (SCA), the Yale Anesthesia Alumni Foundation, and a registration list of the attendees at a TEE conference at North Shore Hospital. Marketing also included attendance at a sales booth during the 1998 SCA Annual Meeting, and marketing at the Internet TEE education web site previously described. The budget for this test marketing was projected, as follows:

Production	\$ 1,500
- includes 100 complete videotape sets	
Mailing	\$ 3,900
- includes 55 cents per letter plus mailing list purchase price of \$750	
Brochure	\$ 200
- illustrator costs for production of a digitized marketing brochure	
SCA Annual Meeting exhibit	\$ 6,000
- hotel, transportation and booth	
Office expense	\$ 1,000
Variable costs for 100 sales	\$ 924
	<u>\$13,524</u>
Opportunity costs (ML)	\$12,000
Opportunity costs (T.R.)	<u>\$ 8,000</u>
Total	<u>\$33,524</u>

Addenda:

1) Purchasing costs for the SCA membership listing consist of a \$300 set-up fee and \$75 per 1,000 names; 2) Cost saving measures employed include re-using an inventory of 100 blank videotapes already in stock, and the use of generic labels which allow customized annotation; 3) Sales above 100 complete sets had been anticipated to incur additional variable distribution packaging and shipping costs of approximately \$7 per unit, with the precise distribution costs dependant on shipping destination. For instance, the cost to mail videotapes to locations on the East coast is \$3, whereas the corresponding costs for a West coast mailing is \$5.

Resources

Company resources can be classified as financial, production, distribution, and research and development. These resources, as follows: a) The financial backing for the start-up costs of the project consisted of venture capital provided by Mel Linzer, the partner described above. This financing was limited to a cap of \$25,000 in his fixed, variable and opportunity costs during the first 12 months of operations. There were no financial intermediaries in this project. Prospective customers paid in advance of delivery. Credit terms were not offered. A transaction was deemed to have taken place only on receipt of a cash equivalent instrument. There were no marketing intermediaries; b) The production facilities consisted of the facilities of Dynamedia, Inc., the production site of the video journal previously mentioned. This production facility also featured a 1-800 number (1-800 - 468-4680), a fax machine, and the capacity to address customer questions on a personalized basis by an individual with an extensive imaging background (M.L.); c) Distribution of the videotapes was by the channel utilized for distribution of the videotape journals mentioned above. This consisted of second class mail purchased at a bulk rate from the US Postal Service (permit #6367). There were no distribution intermediaries; d) The contents of 5 of the 7 videotapes and their accompanying articles and test questions had been fully developed prior to the founding of the company. The remaining 2 videotapes were produced prior to and during the initial marketing phase of the product.

Government regulation of the industry

To our knowledge, there is no government regulation of a bone-fide education videotape industry. There are a variety of regulations pertaining to acquisition of continuing medical education (CME) credits for educational endeavors. However, the company did not seek CME-accreditation for the videotapes.

SECTION 3.

A. STRENGTHS AND WEAKNESSES

Company strengths

Company strengths with respect to the external and task environments are, as follows:

- a) The background of the respective partners in the organization and the societal lattice-like nature of the organization are consistent with maximal adaptability to changes in both the societal and task environments;
- b) A market niche of cardiac anesthesiologists consists of only 5,700 persons. The market niche to be subsequently targeted, namely, US anesthesia personnel in general, consists of only 35,000 persons. These market sizes may be too small to interest other TEE education videotape vendors;
- c) As a group, anesthesiologists tend to be innovators and early adopters of new technology, and might, thus, be expected to be receptive to a TEE videotape series;
- d) There are several sets of videotapes which compete with this videotape series. However, the Texas Heart Institute series is the only product which specifically addresses perioperative topics. This two-module series, available since 1992, has not been widely marketed;
- e) In contrast to other TEE videotapes, these videotapes are designed to be used by both beginning and advanced practitioners;
- f) The articles on each topic which are furnished with the videotapes present the background knowledge necessary for valid image interpretation. The only other competing videotapes which provide hard copy handouts is the Mayo Clinic videotape;
- g) The image orientation in the Mayo Clinic videotape is a mirror image of the image orientation used by clinicians as a whole. The Mayo Clinic approach to image orientation has been a subject of a major, as yet unresolved, controversy in the TEE literature. Thus, the Mayo Clinic images appear “upside-down” as far as non-Mayo Clinic alumni are concerned. This makes it difficult for most observers to concentrate on the videotape material, while still maintaining image orientation;
- h) One of our videotapes is also accompanied by test questions to be completed when the customer has reviewed the accompanying article. This provision is a unique feature;
- i) The price of this videotape series is comparable to the price of competing videotapes when data are expressed as a function of viewing time. The Mayo Clinic videotape consists of a single 60 minute tape, listed at \$95. The Texas Heart Institute product consists of four videotapes, with viewing times which range from 20 to 27 minutes. Each individual videotape is listed at \$75;
- j) Because of its limited memory, a CD-ROM can provide only a minute amount of video. The imaging sequences must be repeatedly looped to provide the appearance of a lengthy presentation. With videotapes, it is possible to devote 75% of video time to real-time images;
- k) The TEE education CD-ROM produced by Churchill Livingstone has had a tortured existence. The initial product had major programming defects which resulted in frequent “crashes”. This problem was so widespread that the company was obligated to institute a product recall. In addition, Churchill Livingstone, Inc., has been recently

acquired by WB Saunders, Inc. The personnel reorganization associated with this merger has resulted in the layoff of many of the staff who had originally been assigned to the CD-ROM project.

Company weaknesses

Company weaknesses (threats) with respect to the external and task environments are, as follows:

- a) An inability to mount a wider marketing campaign, with multiple journal advertisements and exhibits at a variety of National Meetings, because of a cap on the amount of financial resources to be devoted to the project;
- b) The brand name recognition of the Mayo Clinic, the Texas Heart Institute, and the American College of Cardiology productions;
- c) An imprecise view of the potential of the market segment because of a lack of available primary data on this topic. Secondary data, such as the number of TEE consoles which have been sold to either anesthesiologists, or to hospitals for use in operating rooms, are also difficult to obtain.

B. OPPORTUNITIES AND THREATS

External environment opportunities

- a) The ever increasing time constraints of physicians which will inevitably lead to less time being devoted to continuing medical education;
- b) Recent recognition that intraoperative use of TEE can decrease hospital costs;
- c) A recent trend toward marketing of services by hospitals has led to a search for unique features of care that might be emphasized. the provision of intraoperative TEE services could fulfill that role;
- d) The possibility that physicians might value any means whereby the costs of TEE education might be decreased. Videotape education serves as an alternative to travel to meetings (approximately \$1,500) and guest speaker fees (approximately \$1,000 per lecture);
- e) An anticipated flight of academia-based anesthesiologists into the private practice arena. This would place a body of innovators and early market entrants into a higher socio-economic group, a group with a higher disposable income;
- f) The possibility that general acceptance of low cost, efficient videotape education may lead to increased demand for these materials by physicians in other untargeted specialties, such as cardiac surgeons and intensivists;
- g) The possibility that a passing grade in the National Board of Echocardiography perioperative TEE test might become a prerequisite for use of perioperative TEE.

Task environment opportunities

- a) A general lack of commercially-available instructional videotapes with a perioperative bias. Anesthesiologists will have a product available which caters to their specific needs. This product will be the first of its kind on the market;
- b) A general lack of commercially available basic teaching materials for the beginner practitioner;
- c) An absence of commercially-available videotapes with complimentary hard copy text and test questions;

- d) A recently available national certification examination defining competence in perioperative TEE should lead to an increased market for TEE educational materials of all kinds;
- e) The ability to remain a step ahead of the competition by developing second generation videotapes and related products, such as a Web site and CD ROM's, while the competition is still in the process of developing first generation products;
- f) The ability to deliver continuing medical education at a reduced cost;
- g) Recent developments in the publishing industry, whereby many publishing houses are undergoing downsizing or ceasing to exist. These changes should weaken or eliminate some potential competitors

External environment threats

- a) The present volatility of the medical economic climate;
- b) The decreased ability of hospitals to approve capital expenditures for such items as transesophageal echocardiography equipment;
- c) Unlawful copyrighting of the materials by third parties.

Task environment threats

- a) The possibility that the major competitors in the TEE video marketplace might recognize that anesthesiologists may constitute a viable market segment and target them accordingly;
- b) The possibility that other anesthesiologists might develop TEE teaching tapes (a "me-too" approach);
- c) A recent increase in the number of available intraoperative TEE CME-credit courses;
- d) The possibility that the purchasers might decide to purchase TEE textbooks as a less expensive alternative to the videotapes;
- e) The potential for similar educational materials to be made available as a free service via the Internet;
- f) The possibility that teleconferenced live demonstrations of the technique might prove to be perceived as a better teaching medium;
- g) The present inability of the author to produce the highest quality product because of budgetary constraints;
- h) An inability of the author to devote as much time as previously to further research and development;
- i) The possibility that the material in the videotapes may become outdated by advances in the field of TEE.

SECTION 4.

A. ACTION PLAN

Target market

The target market for the videotape series consists of a US consumer market niche. This market niche consists of anesthesiologists who wish to, or are required, to obtain TEE skills. Because this market niche had not been previously tested, there were no historical data on which to base projections. Thus, a subset of this market was selected for test marketing the product. This test market was composed of physicians who might reasonably be expected to be particularly receptive to the TEE education videotapes. Specifically, this sub-niche consisted of members of the SCA, members of the Yale Anesthesia Alumni Foundation, and a registration list of the attendees at a TEE conference at North Shore Hospital at which the author had presented.

Goal

To perform a market test to evaluate the financial viability of the product. Viability is defined as achievement of a sales revenue break-even point within 12 months of implementation of the test marketing action plan.

Market positioning

The market positioning strategy was to bring about the perception that the product is a unique, high quality item. The major focus of the marketing was on brand name recognition. The name, Terence Rafferty, was linked with his affiliation with Yale, his academic rank, and his position of Chief of Cardiac Anesthesia. His experience with TEE was emphasized by stating that he has 15 years of experience in the field, and by quantifying his TEE publications. The impression that was intended to be created was that the author is a premier TEE expert in high demand. Brand name loyalty was reinforced by naming his TEE textbook in the promotional materials. The marketing materials also emphasized that the optimal way to learn about moving images is by means of a videotape, and that videotapes can be replayed over and over again. Further features applied to marketing were the running time of the seminar series (> 5 hours viewing time), and that the buyer would also receive an article on each topic with each module.

Pricing

The videotapes fall into two distinct categories. Modules 1-4 would be difficult to imitate and are ideal for product quality leadership. In contrast, modules 5-7 could be readily imitated. Thus, a two-tiered pricing structure might have seemed to be appropriate for the series, with a skimming pricing structure for the most original modules, and a lower, perceived-value pricing structure for the most readily reproducible modules. However, the scarcity of directly comparative pricing data in the marketplace make it difficult to assign absolute values to such a two-tiered pricing structure. For this reason, the series was marketed as a complete set at a range of prices in order to establish price elasticity and, thus, the "best price" for subsequent marketing. The inclusion of a two-tiered system in conjunction with this maneuver would have unduly complicated data interpretation, and the series was marketed as a complete set.

Marketing

The "when", "where" and "how" of this test marketing are, as follows: a) The test marketing was initiated on February 7, 1998 at an anesthesiology conference on TEE at North Shore University Hospital, Manhasset, New York. This conference, Perioperative Echocardiography - an Introductory Course for all Anesthesia Providers, featured the President of the company, Terence Rafferty, as a guest speaker. At the conclusion of his presentation to the attendees of the conference, Terence Rafferty presented several videotape sequences from the series, and informed the audience that order forms for the series could be found as an attachment to the conference registration hard copy "handout" materials; b) The company obtained three mailing lists, as follows: A mailing list of the US members of the Society Cardiovascular Anesthesiologists was obtained from a commercial vendor. Two further mailing lists were obtained without charge. These gratis lists consisted of a mailing list of the members of the Yale Anesthesia Alumni Foundation, obtained from the Director of that organization, and a mailing list of the registrants of the North Shore echocardiography conference described above, obtained from the Coordinator of that conference. Four separate mailings of a covering letter, a brochure describing the product, and an order form were sent these three groups of physicians during February and March 1998. These mailing utilized a differential pricing structure. The mailings utilized US postal service first class mail to allow for identification of delivery of the materials. First class mail provides for return of undelivered materials, a prerequisite for evaluating the contemporaneous accuracy of the mailing list; c) An exhibit promoting the videotape seminar series was presented at the April 1998 Annual Meeting of the SCA. The exhibit, located in the trade show area of the meeting, featured availability of hard copy promotional materials and a continuously running live videotape, at a sales booth; d) Internet marketing was initiated in May 1998. This marketing utilized the previously described customized web page hyperlinked to a TEE education web site located on a Yale University server. As stated, the marketing web page contained no reference to pricing, a precondition of using Yale University, a non-profit organization, as a host. The web page did include publisher telephone and fax numbers, a 1-800 number, and a hyperlink to a pre-addressed E-mail correspondence form.

Sales force

There was no sales force. Sales originated by customers calling either the 1-800 or regular number, by faxing or E-mailing orders, or by providing a completed order form at the SCA Annual Meeting sales booth.

The 1-800 number was manned by Mel Linzer, one of the partners in the enterprise. Faxed orders received follow-up calls. This direct contact between the manufacturer and consumer was intended to allow for personalized evaluation of consumer wants and needs. It was also hoped that this personalized service would also help to develop a loyal consumer base for future products.

Distribution

There was one distribution channel. This channel had no intermediaries, other than an intermediary for shipping (US postal service). The videotape series was mailed directly to consumers following receipt of a telephone, fax or E-mail order.

Videotape copying took place on a “just-in-time” basis from an inventory of 100 blank videotapes. The videotape copying and packaging was performed at the answering service office. This office, located in Silver Spring, Maryland, is the facility of the Video Journal of Echocardiography. None of these tasks were subcontracted.

Controls

The action plan control measurements consisted of the following data: 1) The absolute number of sales; 2) The number of sales as a function of price (price elasticity); 3) The temporal relationship between receipt of a purchase order and distribution of the product; 4) The number of returned mailings; 5) Returns and allowances; 6). Internet inquiries and sales; 7) Customer comments; 8) Revenues and expenses.

B. RESULTS

Implementation

Each strategy of the action plan was carried out to completion within 4 months of planning.

Sales data

1. The test marketing of the videotapes resulted within the sale of 97 complete videotape sets and 2 individual videotapes in the first 6 months of operations;
2. Ninety-three of the 99 sales were to US customers. These US customers resided in 32 states (Appendix 1);
3. The remaining 6 customers were residents of Belgium, Canada, Iceland, Norway, Saudi Arabia, and the UK, respectively. Five of these six sales specified a videotape PAL format;
4. Two inquiries and 1 sale were attributed to Internet marketing. The inquiry with a subsequent sale was to a domestic customer (Sparks Regional Medical Center, Arkansas). The remaining inquiry was from a prospect in Italy.

Price

There was no statistically significant relationship between sales volume and price ($p = 0.66$; $r = 0.16$). These price elasticity data are presented in Appendix 3.

Customer demographics

There was a statistically significant relationship between the number of US sales expressed on a state-by-state basis and the number of SCA members residing within the corresponding state ($P < 0.0001$; $r = 0.69$).

Marketing strategy

Sales volume varied with marketing strategy. Mailings to registrants of the North Shore TEE conference produced a 4 percent response rate. The SCA membership mailings provided a 1 percent response rate. Yale Alumni Foundation mailings were associated with a 0.9 percent response rate. The sales exhibit at the SCA Annual Meeting resulted in 25 sales. Internet marketing produced 1 sale. The North Shore TEE Conference was not directly associated with any sales. These sales data are summarized in Appendix 2).

Financial data

The income statement for the period January-October, 1998 is presented in Appendix 4. As stated, a differential price structure was employed during this test marketing in order to determine price elasticity. Again, as stated, returns and allowances also played a role in the project. These variables have been factored into these financial data.

Operational data

1. Approximately ten percent of mailings were returned because of an improper/non-current address;
2. The majority of purchase orders were received by mail, rather than by fax;
3. Fifty-seven payments were by credit card (Visa - 23 payments, American Express - 18 payments, MasterCard-16). The remaining 42 payments were by check;
4. Purchase orders were received from clerical personnel representing physician groups or institutions in 10 cases;
5. Purchase orders and payments were received simultaneously in 96 of the 99 cases. The lag times to receipt of payment in the remaining 2 cases were 14 and 29 days, respectively. In a further case, receipt of a purchase order was not followed by payment.
6. Distribution was implemented on the payment date in 40 of the 99 cases. The average delay between payment and distribution in the remaining cases was 11.1 days (range 1 to 28 days).

Customer feedback

Feedback was obtained from direct interaction with consumers. Suggestions for improvement of the videotape series included the inclusion of continuing medical education (CME) credit-like self assessment questions, the provision of videotapes featuring normal prosthetic valve function, and further timed-tests on abnormal TEE findings.

Consumer complaints

There were 4 dissatisfied customers. One customer felt that the videotape seminar series did not merit purchasing, and demanded a refund of the purchase price. A full refund was provided. A further customer who had purchased the videotape series for \$549 also received promotional material with a purchase price of \$249. A partial refund (the difference between the two prices) was provided to this customer.

The remaining 2 complaints related to production and distribution of the videotapes, respectively. One of these customers complained that two of their videotapes were defective, with such poor quality images that it was not possible to read the captions on the tape. This poor image quality had resulted from an improper videotape copying procedure. This defective videotape was replaced free of charge. The final customer complaint related to non-delivery of a videotape set despite prior payment. A videotape set was mailed to this customer.

C. ANALYSIS

Principles

Analysis of the action plan requires performance of two independent critiques, namely, a critique of the overall corporate strategy (posture and moves - "doing the right things"), and a critique of the operational effectiveness (implementation - "doing things right"). The object of the exercise was to establish cause effect relationships ("why") between the test marketing results and the various components of the action plan. Definition of the cause-effect relationships, in turn, allowed differentiation between positive and negative aspects of the plan.

Positive factors in the action plan warrant repetition, while negative factors require corrective action. Corrective action involves either elimination or modification of the corresponding portion(s) of the action plan. Expressed alternatively, the analysis could be characterized as defining guiding principles for use in developing a strategic focus. These guiding principles require "doing more of what was done well" and "doing less of what was "done poorly".

Goal attainment

The three-fold goals of the project can be classified as a financial objective, an intangible objective, and a market research objective, as follows:

- 1) The intangible objective had been to develop a professionally edited inventory of multimedia descriptions of TEE patient examination sequences suitable for use by beginning practitioners, and to develop a multimedia database of TEE findings in commonly encountered perioperative disease states. These objectives were met by production of the videotape series;
- 2) The market research objective had been to gain an understanding of the TEE videotape market in a market niche of anesthesiologists. This objective was accomplished by analysis of the test marketing results;
- 3) The financial objective of the project had been a sales revenue break-even point, exclusive of author opportunity costs, within 12 months of implementing the action plan. This objective corresponds with a net operating income hurdle rate of 0%. This return on investment was achieved within 6 months of plan implementation.

Consumer demographics

The geographic sales density distribution in the 32 states from which purchases were made paralleled the state-by-state population density of SCA membership. This suggests that the sales volume was not unduly influenced by purchases made by acquaintances of the author, a factor which would have required major downward revisions in forecasts of the size of the remaining market (see Appendix 1).

Payment pattern

Payment was received from either a physician group or institution, rather than an individual physician, in 10 of the 99 cases. A subsequent telephone survey of the consumer database revealed that virtually of the consumers had purchased the videotapes on behalf of a physician group, with the average purchase representing 4 physicians. Group purchases

eliminate multiple potential customers, rather than simply the purchasing customer. The impact of this factor is that the 99 sales would have to be considered as 396 sales. The remaining market for the videotapes is, thus, significantly smaller than one would have initially anticipated.

Pricing

There was no significant relationship between quantity demanded (sales) and price within the price range of the study. This inelasticity suggests that the price for the videotape series be set at, or above, the uppermost asking price, assuming constancy in the marketplace.

Marketing

The marketing strategies consisted of promoting the videotape series at a lecture on TEE, selective mass mailing of promotional materials, presentation of a sales exhibit at a national meeting of individuals perceived to be particularly receptive to TEE, and Internet marketing.

Lecture promotion

Lecture promotion was not associated with any immediate sales. However, a sample size of one lecture could not reasonably be expected to adequately represent the power of this marketing medium. In addition, lecture-promotion of the series may have sensitized the audience to subsequent mass mailing.

A response rate of 1-2 percent is considered to represent a successful mailing, and the response rate of mailings to conference registrants was 4 percent. In addition, providing TEE lectures does not result in financial outlays or lost opportunity cost from the partners of the company. Accordingly, it would seem prudent to continue with this particular marketing strategy.

Mass mailing

Mass mailing represented the primary vehicle for sales, and, as such, bears repetition.

Sales exhibit

The presentation of the sales exhibit provided sufficient sales to exceed expenses and opportunity costs. Equally importantly, this intervention also provided an opportunity for first-hand assessment of both consumer needs and wants and the level of competition. For these reasons, this strategy also warrants repetition.

Internet marketing

The Internet marketing results (two inquiries and one sale) suggests one, or more, of the following possibilities:

- a) Internet marketing, by its nature, is without merit; and the marketing web page should be discontinued;
- b) The duration of Internet marketing (5 months) was inadequate to properly evaluate this marketing medium;
- c) The Internet marketing strategy which was adopted in this test marketing action plan was flawed, and should be reconsidered.

The first possibility may, in time, prove to be the case. However, it would seem more prudent to focus on the second and third options as more likely possibilities. A 5 month trial of Internet marketing on a new web site is probably insufficient for gauging the true impact of this medium on sales. One experienced webmaster, consulted for analysis of these results, emphasized that it usually takes up to 12 months for a new web site to be incorporated into the databases of the major search engines, even following concerted efforts to formally register the site.

A further Internet strategy which might have been employed could have been to list the videotape series on a web site with pre existing heavy traffic by users and potential users of TEE. The TEE web page of Amazon.com fulfills this prerequisite. The logistics of implementing this approach will be described in the succeeding section.

Production

The production strategy consisted of "in-house" publication on a "just-in-time" basis. The inventory of raw materials was sufficient to avoid an actual "stock-out". However, the margin of comfort was uncomfortably close, and the author was forced to remit his hard copy reprints of the TEE articles to the distribution center on a semi-emergent basis in order to fulfill the orders. In addition, performance of mass mailings coincided with production of the videotape sets. The timeline of directly confluent marketing and production schedules decreased the risk of a build-up of unsold inventory. However, this situation stretched the time resources of the partners well above capacity, and, undoubtedly, contributed to the production and distribution of the defective videotape set.

Distribution

The distribution utilized a single distribution channel. This single channel, again, originated "in-house". Flaws were apparent, as evidenced by the duplicate mailing of promotional material with different prices to the same individual, and the non-distribution of an order to a customer who had remitted payment. A divergence of production and marketing schedules would have allowed the luxury of a more orderly, less frantic schedule, and the institution of both production and distribution quality control mechanisms.