Feasibility Study for a New Venture in Information Technology

by

Tanya Ney

M.B.A., Simon Fraser University, 1995

Thesis submitted in partial fulfillment of

the requirements for the degree of

Master of Business Administration

in the Faculty

of

Business Administration

SIMON FRASER UNIVERSITY

August 1995

Approval

Name:	Tanya Ney
Degree:	Master of Business Administration
Title of Thesis:	Feasibility Study for a New Venture in Information Technology

Examining Committee:

Dr. Ed Bukszar, Assistant Professor
Senior Supervisor

Dr. Richard Schwindt, Associate Professor
Faculty of Business Administration
Simon Fraser University

PARTIAL COPYRIGHT LICENSE

I hereby grant to Simon Fraser University the right to lend my thesis, project or extended essay (the title of which is shown below) to users of the Simon Fraser University Library, and to make partial or single copies only for such users or in response to a request from the Library of any other university, or other educational institution, on its own behalf or for one of its users. I further agree that permission for multiple copying of this work for scholarly purposes may be granted by me or the Dean of Graduate Studies. It is understood that copying or publication of this work for financial gain shall not be allowed without written permission.

Title of Thesis/Project/Extended Essay

Feasibility Study for a New Venture in Information Technology

Author:
(signature)

Tanya Hay
(name)

August 11, 1995
(date)

Abstract

This paper examines the feasibility of a new venture information technology. To determine the feasibility of the venture several factors were examined. These included the general economic and political climate, the size of the market, predicted market growth, ease of entry and exit, capital requirements and industry profitability. The strength of the competition was also considered, including substitute products and future strategic moves.

Based on the analysis of the market, estimates of the market were calculated and sales projections were prepared. From the sales projections the detailed financial pro forma were created and analyzed.

With minor modifications to the initial strategy the conclusion was that the venture would meet the objectives of the primary participants and that it should preceed.

Dedication

This paper is dedicated to "Uncle Dave" and all my family and friends for their tireless support and encouragement.

Table of Contents

Table of Tables

Table of Figures

Chapter I
Product Description

Parameters of the Study

The purpose of this study is to examine the feasibility of a new venture in information technology. The proposed venture will have two mandates; to develop, market, and distribute a software product for physician offices and to undertake contract software development work. The software product will be developed over time but the initial phases of the product will include the following components: patient registration, patient billing, and patient scheduling. Future phases of the product will include: physician orders and patient results reporting.

One of the principals involved in the venture currently undertakes contract work to supplement his income. This contract work will be continued under the new company. The contract work will be used primarily to supplement the revenue during the startup phase of the venture and will not be the focus of the venture.

The purpose of the paper is not to establish the operational plans for the company, but rather to examine whether the proposed venture is viable. Key factors to be examined before making the recommendation as to the viability of the venture are the following:

- The general economic and political climate.

- The market characteristics including the size of the market, predicted market growth, ease of entry and exit, capital requirements and industry profitability.
- The strength of the competition, including substitute products, price, features, performance, distribution, service and future strategic moves.
- An internal analysis including the skill set of the people involved, the product, and financial resources.

Based on the findings from the above analysis, various strategic alternatives will be recommended. The recommended strategic alternative will then be compared to the objectives of the principals involved in the venture and a final recommendation will be made.

Objectives of the Participants

This venture is largely a family operation. There are three primary participants in this venture who are all related and several other participants who are acting as advisors or consultants. The three family members are Dave H., Brian P. and Denis P. The other participants are Ione H., Barry B., Steve M. and Kathy M.

The objectives of the primary participants are to:

- realize a reasonable return on their investment. By reasonable the participants want to have an operating deficit of not more than $50,000 in the first year, break-even in the second year and realize a

16 percent return on equity in the third year. Sixteen percent is the industry average for return on equity.

- Dave H. and Steve M. would like to be more independent. The software industry is extremely competitive and volatile and Dave and Steve would like to be more in control of their own destiny.
- Dave H. and Steve M. would like to realize a greater return for their efforts than they are currently receiving from their employer. The software industry is notorious for long hours and impossible deadlines, however few companies pay for overtime worked. By working for themselves Dave and Steve hope to not only draw salary from the business but also build up a profitable operation.

The New Software Product

The proposed product is currently in the prototype stage. Full development of the product will not proceed until the viability of the venture has been established. To date Dave has done most of the work on the product with input from his brother-in-law, Brian, the physician, and from Dave's wife, Ione, who has worked as a medical office assistant. Dave has also drawn on his knowledge of the healthcare environment and the current trends in the computer industry. The company where Dave is currently employed and where he has worked for the past eight years produces software for hospitals.

The product will utilize a Windows front-end and a relational database for the backend. The product front-end will utilize the new Windows 95 (Chicago) look and the relational database will be MS Access

2.0. The system infrastructure will be Client Server. This type of infrastructure along with the relational database will allow the system to be extremely flexible. In addition, the product will be designed so that a physician may purchase just one or more of the modules or the complete system.

Although it is envisioned that the system will change and develop over time the first phase of the system will be comprised of a patient registration function, patient billing and patient scheduling. Future releases of the product will include the ability to record all the information pertaining to the patient's chart in the system thereby creating the paperless chart. The paperless chart means that all the patient's medical history including diagnoses, prescriptions, and vital statistics will be maintained on the system.

It is the functionality associated with the paperless chart where current technology has the most application. There are many aspects of the chart that can be automated by using "expert" type logic, new communication protocols and a strong graphical user interface. These technological advances can be used for checking contra-indications between drugs, automatically updating the patient's chart with laboratory results, and generating automatic alerts for the physician regarding pre-existing conditions or illnesses.

For the first release of the product the functionality of the product will be as follows:

Patient Registration

The patient registration function will capture basic demographic information about the patient. This information is important for the purposes of maintaining the patient chart and for billing. The information collected will include the patient name, gender, date of birth, marital status, home address, home phone number, work phone number, next of kin, and physician(s). As the system is designed to be very flexible, information such as the patient's address and phone number will be captured in a very generic manner. The person using the system may define what types of addresses they would like to capture and the information associated with that address. For example, there may be home, work, summer residence and next of kin addresses. The same types of rules will apply to a lot of the information collected. This will allow the system to be setup according to the needs of the physician and the clinic. For example, a walk-in clinic may not need to capture as much information as a clinic that handles dialysis patients who are visiting their physicians on a regular basis.

Once this information has been collected it will always be available for viewing or updating. Collection of the information will be facilitated by providing a card swipe for the healthcare card which will allow the information on the card to be either entered into the system if the patient is new or updated if the information has been changed. In addition an on-line validation of the person's healthcare coverage will be provided. The on-line validation is to handle new or walk-in patients that do not have their healthcare cards with them.

Patient Scheduling

The second major component of the system is patient scheduling. The scheduling module will utilize MS Scheduler+. MS Scheduler is a product that has built-in rules regarding scheduling. It checks for conflicts, allows for block booking of repeating appointments, prevents overbooking or booking on holidays and facilitates the rescheduling of appointments with the patient's preferences in mind. The advantage of using an existing product is that it reduces development time and effort and as a consequence reduces the cost of developing the product.

The scheduling module will automate the process of making patient appointments, scheduling office time and clinic time, and booking off for vacation or study leave. Anyone using the system will be able to view the appointments for a single physician or for all the physicians in the office. This will allow them to select an appointment time or simply ask the system to find the first available appointment time based on the patient's preferences. The system will also allow the user to block unavailable times on a recurring basis for all the physicians or for a single physician. If a major change happens to the schedule, like a physician booking off sick then the system will assist with re-scheduling those appointments by finding other available times for those patients and by producing a notification list of patients affected by the changes.

The system will also assist with patient reminders and rescheduling recurring appointments, like Pap smears. For patient appointments where a reminder is required the system will produce a

pre-defined reminder letter reminding the patient to either book an appointment or that they have an appointment time.

The system will replace any manual appointment book, it will be on-line for everyone to view and it will automate the entire process which should provide considerable time saving to the receptionist and other office staff.

Patient Billing

The Patient Billing function will allow the physician to bill for the patient's visit on a fee for service basis. The physician may bill any one of a number of agencies for the patient's visit including the Medical Services Plan (MSP) or the Worker's Compensation Board (WCB) or the patient themselves. If the physician is billing MSP the system will provide a file that may be transmitted to MSP electronically. When billing another agency the system will prepare the statement in the format required by that agency. When billing an individual a statement will be prepared in a format similar to the statements sent by BCTel and BC Hydro. Only basic accounting will be done by the billing function, details of amounts owed and amounts paid will be either available from reports or interfaced to an Accounting System such as Quicken. The accounting system will track overdue accounts, outstanding receivables and the revenue accrued.

Entry of charge amounts and corresponding information required for billing will be done using the patient list. The patient list is a list of patients generated by the scheduling module. Once a patient has been

seen by the physician, the receptionist or office assistant will take the chart and enter information directly into the system regarding the patient's visit. This information will then be used by the system to generate the appropriate charges and billing information.

Other Functions

In addition to the major functions listed above the product will also provide for standard reports and ad hoc reports using a report writer that is compatible with MS Access. Labels for specimens and mailing lists will also be available utilizing either the report writer directly or by producing an extract. Once the extract has been produced using the report writer it could then be imported into a standard word processing package.

The setup of the system will be maintained through table maintenance functions. The tables will contain the fee codes for billing, the ICD9 (International Classification of Diseases) codes, clinic setup codes and default codes to assist with faster data entry. In addition the system will have security profiles that will restrict entry to various functions depending to which profile the individual belongs.

Security is an important feature in this system for two reasons. First, the information contained on the system is extremely confidential and second it is very important that the information not be tampered with either purposely or accidentally. Initially, security access to the system will be at a functional level. For example only those individuals, such as the physicians, with the appropriate security profile will have access to the patient's chart. The medical receptionist may have a

security profile that only allows access to the patient's demographic and billing information.

Charting Module

The initial release of the product will focus on billing and patient scheduling but the final objective is to provide a fully computerized patient chart. This means that rather than having all patient information on a paper chart that must be filed and maintained all information pertaining to the patient will be available on the computer system. The types of information that will be collected will include past illnesses, visit history, allergies, family history, consults, treatments, lab work, pharmacy orders and care plans.

The automation of the chart will mean the physician no longer has to flip through the chart looking for previous prescriptions or notes about allergies, that information will be available by simply clicking the mouse or pointing a light pen to the appropriate spot. In addition the system will make use of other systems to enhance the functionality of the chart. For example there is software available that will check for drug contra-indications thereby assisting the physician with the prescription process. To reduce development time and to provide a more competitive and comprehensive system, links to other systems such as the pharmacy module will be done as much as possible.

Currently a physician will make hand written notes in the chart about orders for tests, perceptions and diagnoses. Many physicians would be reluctant to type this information into a computer. To facilitate

the process there will be three aspects to the charting functionality of the system. First, the computer of choice would use pen computing. This would allow the physician or assistant to write directly on the screen. These hand written notes would then be stored directly on the chart. An alternative would be to use pen computing to convert the handwritten text into typewritten text.

The second aspect of the system is that as much as possible the system will make use of standard lists/codes. For example, the system will contain lists of all standard laboratory tests, and radiology examinations and prescription medicines and dosages. This will allow the physician to simply pick from the list and update the patient chart, thereby removing the need for typing or writing. Orders will then be printed before the patient leaves the doctor's office.

Many physicians may be reluctant to go to the expense of installing computers in every examining room. To overcome this problem the system will utilize a radio link from handheld computers to the main system. This will mean that a physician's office would only require one hand held device per physician. In addition the physician would be able to move freely between his office examining rooms and still have access to the patient's chart.

In addition to being able to move freely about the office physicians will also be able to access the medical record remotely via modem. This means that the physician will be able to access the patient's chart from

home, from the hospital or any other location where the physician may be located.

Price

The system will be comprised of three modules and each module will be priced separately. To purchase the system the physician would pay a base price for the system and this would include the base component, patient registration. Patient registration is necessary for any of the modules to operate. Any modules in addition to patient registration would be priced separately. This means that a physician could use the system for scheduling and charting, or charting and billing or for all three functions, billing, scheduling and charting.

In addition all users will pay an annual maintenance fee for support and system upgrades. The maintenance fee will also be broken down into 3 levels depending on which modules the client is using. For each module that is added the physician will pay an additional amount for maintenance.

The selling price and the maintenance fee will be structured to be competitive with the other existing vendors, yet high enough to convey that the product is of high quality. The pricing structure will be as follows:

Table 1 - Software Price Table

Module	Selling Price	Maintenance Fee (per annum)
Base module	$875	$500
Patient billing	$350	$100
Patient scheduling	$450	$150
Patient charting	$3000	$1000
Entire system	$4400	$1600

Note for those physicians who purchase the entire system they will receive a small discount(5%) on the purchase price and the maintenance fee.

The pricing structure outlined above would mean that a physician who just interested in the Billing System would pay $1225. The average for the industry is $1202. However several firms will charge an additional amount for extras that other firms consider as part of the standard package, such as a fee schedule update. If the additional items are added to the base price for these firms the average price in the industry is $1323.

If the Scheduling Module is added to the Billing Module the cost would be $1675, without the Billing Module the cost would be $1325. There are only two firms which price the scheduling component separately. The average cost is $1869, however there are wide variations in the degree of sophistication provided in these systems so it is difficult to compare the pricing structure.

The maintenance fees are little higher than the average. The average cost per annum for maintenance in the industry is $550. However one of the strategies of the venture is to provide better than average support so fees have to be structured accordingly.

Maintenance

Maintenance will be comprised of two components: regular upgrades and support. Clients paying maintenance fees for their software will receive two system upgrades a year per module. The upgrades will include minor software enhancements, changes to accommodate government regulatory changes and fixes to software problems.

The Ministry of Health, will, from time to time issue changes to either the type of information that must be sent with the billing claim or to the structure of the information that is sent. Software changes to accommodate this type of government change will be included as part of the maintenance agreement. The client will also receive a guarantee that as long as the government gives 180 days notice of any changes, the client will receive the software upgrades 30 days prior to the implementation of the change. The government currently has a commitment to all vendors that they will be notified at least 180 days in advance of any software changes that are required.

Any major software enhancement, outside of the government changes, will be released as part of a new module and will be priced separately. A major software change would mean the addition of a new function with substantial functionality. A minor software change would mean a change to an existing function without substantially changing the module, or a fix to a software problem. These types of

enhancements will be included as part of the regular upgrades that clients will receive twice annually.

The client will also receive regular support. The support provided will include a 1-800 number where a client may phone for support 8am-5pm, Monday to Saturday. Support will be provided either over the phone or via modem. Three of the major competitors provide a toll-free helpline but only one provides modem support. The lack of sophistication of many of the products on the market make modem support not an option. The vendors who do provide modem support, assist their client either by talking them through the problem or visiting the clinic personally.

No training will be provided with the product. The system will follow current industry standards for the user interface and will be intuitive in nature for personnel familiar with physician practice systems. The system will come with on-line context sensitive help and each module will come with an on-line tutorial. In addition much of the setup for the system will be done in advance of the client installing the system so that the system is ready to use once installed. The setup that will be done prior to installation will include the definition of the billing codes, the definition of the diagnosis codes and default security profiles. However for users that do not feel comfortable installing the system or who require additional assistance this will be available on a time and materials basis.

Hardware Requirements

The hardware requirements for the system will be determined by the modules being used, the size of the practice and the number of users. Outlined below are a number of configurations and approximate prices for practices using patient registration, patient billing and patient scheduling.

Due to the client/server nature of the system's architecture, two hardware configurations have been specified. In a single PC configuration, it is recommended that the 'Server' specification be adopted as it offers better performance an greater expandability for the future.

Client PC(s):

486 66 MHz CPU (VLB/PCI busing)
8 MB RAM (minimum)
540 MD HD (minimum)
14-15" SVGA NI Monitor
VLB/PCI Video Card w/ 1 MB RAM (minimum)
Ethernet Network Card
Keyboard/Mouse
Standard I/O Card (2S/1P ports)
Optional:
2-4X CD-ROM
16 bit Sound Card

Server PC:

Pentium 90 MHz CPU (PCI busing)
16 MB RAM (minimum)
540 MB RAM (minimum)
14-15" SVGA NI Monitor
PCI Video Card w/ 1 MB RAM (minimum)
Ethernet Network Card (only with multiple PCs)
Keyboard/Mouse
Standard I/O Card (2S/1P ports)
Optional:
2-4X CD-ROM
16 bit Sound Card

Other peripherals:

Printer(s) (InkJet technology)
14.4 Fax/Modem (minimum)
Optional:
Magnetic Card Reader(s)
Bar Code Printer(s)
Zenith Cruise Pad (portable terminal)

Operating Environment Software:

Option 1:
MS-DOS 6.22
Windows For Workgroups 3.11 (WFW)
MS Office Pro

Option 2:
Windows '95 (Chicago)
MS Office Pro

Option 3:
Windows NT 3.5 (Server/Workstation)

Note: These platforms can be inter-mixed between server and clients according to the user requirements.

The following costs are estimated based on prices as of June 1995 and may vary depending on make, model etc. The cost quoted refers to PC configurations that **include** the optional hardware items stated. The optional quotes assume one (1) equipment item at each client workstation, although this is likely not necessary.

Table 2 - Hardware Price Table

Hardware	**1 User**	**2 Users**	**3 Users**	**4 Users**
Server PC	$2500	$2500	$2500	$2500
Client PC	n/a	$1500	$3000	$4500
Fax/Modem	$130	$130	$130	$130
Printer(s)	$400	$400	$800	$1200
Total:	**$3030**	**$4530**	**$6430**	**$8330**
Card Reader(s) (optional)	$200	$200	$400	$600
Bar Code Printer(s) (optional)	$350	$350	$700	$1050
Light Pen (optional)	$150	$150	$300	$450
Cruise Pad (optional)	$1800	$1800	$3600	$5400
Total 2:	**$2500**	**$2500**	**$5000**	**$7500**
Grand Total: (T1 + T2)	**$5530**	**$7030**	**$11,430**	**$15,830**

The Contract Work

The contract work done by this venture will not be the focus of the business. Contract work will be done to supplement the revenue during the early startup phase. Whether or not the contract work will continue after the venture is established will be determined based on profitability and available resources.

The contract work will be comprised of small custom programming jobs. Whether any job is undertaken will be decided on the nature of the work and whether or not resources can be assigned to the job. Each job will be quoted to the client based on the number of hours required to analyze, program, test and document the software change or enhancement. Shipping and handling charges will be in addition to the original quote. The hourly rate may vary depending on the job but will be generally $65.00 an hour.

The demand for this contract work is well established. The company that currently employs Dave H., Steve M. and Barry B used to supply hospitals with what is termed an entire HIS (Health Information Systems) solution. This meant that this company either produced themselves or had third party agreements with other vendors for virtually every system required by a major hospital. This included financial, patient administration, pharmacy, laboratory, radiology, payroll, scheduling and nursing systems. Recently this corporation has decided to concentrate on only a few products, as a result the other products are being maintained but they are not being enhanced. The company has

125 clients throughout Canada that use what is now referred to as the legacy systems.

Dave H. has considerable experience on the patient administration systems and he is well known by the hospital clients. Last year he did contract work valued at $26000 in addition to his regular employment. The clients make requests to the company and then the company sub-contracts the work to Dave H.

At the moment the company has 225 software requests on file from hospitals who have the patient administration systems installed. There are 65 installations of the patient administration systems Canada wide. All of these software requests have been vetted as to whether they are feasible and the number of hours that they may take to complete. Of the 225 requests the clients are willing to pay for requests amounting to 700 hours. Many clients, although they may request a change, are not willing to pay for the change when it is in addition to their regular maintenance fees.

If Dave H. undertook all of the contract work at $65 an hour this would amount to an additional $45,500 in revenue. As it is unlikely that all of the clients would pursue their change requests and the time that Dave H. has available is limited, this figure can be considered unrealistic. According to Dave H. he can envision doing approximately 350 hours of additional contract work in the first year. This would mean that the venture could envision an additional $22,750 revenue in the first year.

The Proposed Strategy

The participants in this venture have identified four elements to their business strategy. The strategic focus of the venture is to be the first on the market with a product that employs much of the latest technology. Other features of the strategy are a level of investment to grow the company, a marketing strategy for rapid market penetration, and the unique skills and attributes of the participants involved in the venture.

The first part of the strategy is to be the first to develop a product unique from the competition in terms of features. The unique features of the product are:

- the Windows based user interface;
- the modular approach that will enable the physician to buy only one or all of the modules;
- the system architecture which will allow those supporting the products to dial directly into the physicians' PC and investigate what may be wrong;
- the relational database which will allow the physician to write and customize reports much more easily;
- Client server technology which will allow the physician to easily add more workstations as required and to provide true multi-user functionality.

In addition the product is being built to allow for the future development of the Charting Module. This module is comprised of many

elements that will be developed over time, however the advantage will come from the fact that the system will allow for the addition of these features. Systems that employ old technology do not have this ability. The unique features that will be part of the Charting Module include:

- data input by either voice, point and click, handwritten or typewritten;
- the remote handheld devices that will allow the physician to move about the clinic freely;
- interfaces to remote diagnostic systems such as laboratory systems.

The ability to provide the proposed features of the product come from the knowledge and background of the principals involved. This knowledge of both the latest technology combined with an understanding of the medical software industry is where the participants hope to gain their second strategic advantage.

The third strategy which the participants intend to employ is marketing the product. Through researching the market the participants were able to establish that the other vendors do not directly promote their products through advertising or direct sales. The proposed marketing strategy encompasses advertising, promotion and direct selling. Details of the marketing strategy are in Chapter III.

The fourth element of the proposed business strategy is a level of investment that will allow the venture to grow. The participants believe that many of their competitors are either investing only to maintain their position in the marketplace or are milking the business by investing as

little as possible. The participants feel that if their competition were investing to either lead or dominate the market that there would be more evidence of the other vendors moving to new technology. Details of the capital requirement and level of investment available are detailed in Chapter IV.

The Timeline for the Venture

The timeline for the venture is important for several reasons. Much of the strategic advantage will come from being the first on the market. Second, during the early product development phase the principals primarily concerned with the development of the product will continue in their present employment. This means that much of the early work will be done on a part-time basis only. The move from employment to self employment will be timed to coincide with critical points in the product development phase. As people move to full-time employment in the venture the operating costs will be impacted significantly so they are also being timed to coincide with points where the principals of the venture envision that there will be some revenue.

Appendix A includes a gantt chart that indicates the critical path for the venture, approximate timeframes for various tasks and approximate timeframes for when employees will be brought on full-time. Also indicated is the date for the product launch. The notable dates are as follows:

- August 31 1995, phase one of the product complete and ready for installation and beta testing.
- November 1, 1995, Dave H. begins full-time employment in the venture
- November 30, 1995, phase one beta testing and fixes complete
- January 3 1996, product installation of phase one into 3-4 other beta sites
- January 1, 1996, Steve M. begins full-time employment in the venture
- February 1, 1996, phase two of the product complete and ready for beta testing
- March 1, 1996 product launch of phase one
- May 1, 1996, phase two beta testing and fixes complete
- June 1, 1996 product installation of phase two into 3-4 other beta sites
- July 1, 1996 product launch of phase two

Chapter II
External Analysis

Introduction

Critical to the assessment of the viability of this venture are factors external to the venture itself. These include the general economic and political climate, the availability of financing, trends in information technology, and future prospects in the software industry. All of these factors will be examined in depth as they relate to the proposed venture.

General Economic Forecasts

A general economic forecast is important as in economic downturns investors are less likely to invest in high risk new ventures and are more likely to invest in safer investments such as the money market. As the Federal Government undertakes exhaustive economic analyses before releasing the annual budget the information regarding economic forecasts for Canada have been taken primarily from the 1995 Federal Budget. Any error in forecasting could have serious implications for the Canadian government and economy. For example, an increase of one percentage point in all Canadian interest rates would increase the deficit by $1.7 billion in the first year.

According to the Budget Book the Canadian economy is stronger than it has been for years. The government substantiates this claim with the following statistics:

- real output grew 4.5% in 1994, the fastest growth in the G7 countries;
- 433,000 jobs were created in 1994, all of them full-time and the unemployment rate fell 1.7% to 9.7%;
- manufacturing output grew 9%;
- at 1.5%, excluding the effects of the tobacco tax, inflation is at its lowest rate in three decades;
- unit labor costs have fallen 1.3% since mid 1993;
- improved performance has led to record-breaking exports, a growing trade surplus and a dramatic improvement in the current account.[1]

The government documents go to great lengths to further explain that this growth phase is expected to continue. The document, "Creating a Healthy Fiscal Climate", outlines that private sector and government forecasts for the economy are very much in line. The private sector forecasts are outlined below:[2]

---

[1] Department of Finance, *Budget in Brief,* Department of Finance publication, Ottawa, 1995, pp 1.

[2] Department of Finance, *Creating a Healthy Fiscal Environment,* Department of Finance publication, Ottawa, 1995, pp 15.

Table 3 - Economic Forecasts

	1994	1995	1996
Real GDP Growth	4.0	3.8	3.8
GDP Deflator Increase	0.5	1.5	1.9
Nominal GDP			
• $ billion	744	783	826
• Percent change	4.5	5.2	5.5
Employment Growth	1.9	2.3	2.3
Unemployment Rate	10.5	9.8	9.3
90-day commercial paper rate	5.6	6.2	5.6
10 year government bond rate	8.3	8.2	7.5
CPI Inflation	0.3	1.7	1.9

Most forecasters expect that the current cyclical upswing in the economy will continue but at a more moderate pace. Key factors slowing the growth are the slowdown in the US economy and the Canadian interest rates that remain high relative to inflation.

Growth in the economy requires an increase in aggregate demand. Aggregate demand being the sum of consumer demand, investment demand, net exports and government demand. Consumer demand is expected to remain strong, but this will be very reliant on unemployment rates continuing to decline and this may be jeopardized by the government reductions in the public service. Investment demand is also expected to remain strong, but this will be determined by interest rates remaining low and if the Canadian dollar is stable. The government also expects exports to remain strong despite the weakening of the US economy. Forecasters expect overseas economies to pick up over the next few years and this will drive the Canadian balance of trade.
The one factor that is not expected to grow is government demand. The extent that this will affect overall growth is unknown.

Interest rates are also expected to remain low. However, forecasters do expect some upward pressure on interest rates from the higher US rates. In addition the Canadian Reserve Bank and the US Federal Reserve Board are determined to keep inflation low. This will mean a constraint on the money available in the economy and hence more pressure on interest rates.

However, the recent increase in interest rates can be partly attributed to the fact that the financial markets have been extremely concerned about this budget and the strength of the economy. This has resulted in the Canadian dollar being weak which has also put pressure on interest rates as the market adjusts to ensure that the required returns to foreign investors are met. The Budget should send a strong signal to foreign investors that Canada is working hard to ensure the fiscal health of its economy and that Canada and Canadian bonds are a safe investment option.

The economic outlook would appear to be strong. The government and the private sector are predicting that the Canadian economy is in a strong growth phase that will continue for some time. As the economy expands this should ensure that business confidence remains strong, that consumers continue spending and that money is readily available for investment purposes.

Political Implications

New ventures, where the risks are relatively high, may not be able to acquire financial support from traditional sources such as banks. Where the venture is as yet unproven the government can often be a source of funds until the venture is established and can demonstrate its viability. Information as to the government's intentions with respect to the business sector have also been taken from the recent Federal Government Budget and related documents. The government made many policy statements in their release of the recent budget regarding the business sector and its importance to the Canadian economy.

The government's primary economic objective, according to the Budget document is to "sustain strong growth and job creation". To this end the budget has been formulated around the following:

- reformation of government programs and procedures to eliminate waste and abuse and ensure value for the taxpayers' dollar.
- substantial reduction in business subsidies.
- changes to the major federal transfers to the provinces to better reflect responsibilities and fiscal requirements.
- changes to the labor market programs to foster increased employability.

Through the initiatives announced by the government, the government intends that for every new dollar in tax revenues there will be a seven dollar reduction in expenditure. The reduction in government

expenditures will come from funding a smaller public service, as approximately 45,000 jobs will be cut, a 60% cut to business subsidies, a merger of some government programs, and smaller transfers to the provinces from a new Canada Social Transfer. The increases in government revenues will come from increased cost recovery for services provided by the government, higher taxes for large corporations and banks and a 1.5 cent per litre excise tax on gasoline.

However despite the cutbacks mentioned above the government also reiterated their interest in stimulating the economy through small business, particularly in the area of technology. Although the government is cutting back on business subsidies this is primarily in the area of transportation and agriculture. Subsidies in the form of "patient money", will continue to be made available. That is the government will not require any return on their investment immediately.

To support small business the government is taking measures to improve the business climate for entrepreneurs. Measures will be taken to reduce the paper burden, Canada Business Centers will be expanded, the Small Business Loans Act will move to full cost recovery and there will be some regulatory reform.

The government also intends to work with the banks over issues of bank financing. Already the banking industry has developed a code of conduct. The code of conduct is directed at making the borrowing process more transparent and the banks more impartial when it comes to resolving credit related disputes.

In general the latest Federal Budget and associated policy initiatives can be seen as positive moves for new ventures. The government has acknowledged that the key to the success of their fiscal policies will be a strong economy and to a large extent the strength of the economy will be fueled by a strong business climate.

Financing Options

Financing is a critical aspect to any new venture and the availability of finance must be evaluated. Although some of the capital for this venture will come from the principals themselves, it is anticipated that the venture will require additional financing. There are basically three avenues through which financing may be available: the government, financial institutions such as banks and the venture capital market.

Prior to the Budget the following types of government business subsidies were available to business ventures. Although there is likely to be some change to the number and structure of the subsidies, that is not known at this time.

- Western Economic Diversification Program. Western Economic Diversification Canada, (WD), is a federal department that works with business and other levels of government in western Canada to strengthen the region's economy. WD provides no interest loans to help businesses with fewer than 50 employees develop new products, enter new markets, introduce new technology or replace imports.

Assistance is usually provided as a top-up, amounting to 25 to 45 percent of proposed costs.

- Revenue Canada, Small Business Financing. The purpose of this program is to help in the refinancing of existing loans. Revenue Canada will provide loans of $10,000 to $50,000 for a period of one to five years at lower than prevailing market interest rates.
- Federal Business Development Bank (FBDB). The purpose of the Federal Business Development Bank is to promote and assist small and medium-sized businesses in Canada, either at the start-up stage or at any other stage of their development. The FBDB complements the services offered by financial institutions in the private sector by providing funds for worthwhile projects that cannot obtain financing elsewhere.
- Technology BC. The purpose of Technology BC is to stimulate the development and application of science and technology for the economic benefit of the province of BC. There are two types of funding available. The Industry-Based Research and Development Program is designed to stimulate applied research and development in BC. Funds up to 50 percent of eligible project costs will be provided for the development of new products and processes, prototype demonstration and evaluation projects. The other funding, Core Research Program, is designed to encourage strategic research at the pre-emptive level. This program would be of particular interest to groups such as industry consortia, not-for-profit research agencies and post secondary institutions. Technology BC may provide up to 100 percent of the eligible project costs.

- Product Development Fund. The purpose of this fund is to invest in new product development projects of BC companies involved in the application of Advanced System Technologies to industry needs. Up to 75% of the project costs to a maximum of $100,000 is available. The terms specify that the payback of the grant is from royalties from sales, the project must be less than one year duration and the proposed work must relate to ASI disciplines such as robotics, microelectronics, computers, communications, and artificial intelligence.

The types of subsidies available appear to favor high tech companies. As the proposed venture is high tech the participants intend to investigate every possibility of obtaining funds from the government and related agencies. The terms associated with the subsidies are often lenient and they do not require an immediate payback. This could be important to this venture as aside from contract work there will be no revenue in the early stages while the product is being developed.

The banking industry would also appear to be very interested in supporting new ventures in information technology. The "Globe and Mail" reported on February 27, 1995 that most major banks are beefing up their high-tech lending by creating special centers across the country that cater to the needs of "knowledge based" companies.[3] The five big

---

[3] Zeidenberg, Jerry. "How banks target high tech", The Globe and Mail, February 27, 1995, pp B 10.

banks are now reportedly offering the following services to new high tech companies.

- The Royal Bank is pursuing this market most aggressively. In 1994 it took out full page ads in major newspapers to announce 20 new high tech lending centers across the country. There are now 25 such centers with about 45 account managers dedicated to high tech customers. In the previous nine months the Royal Bank lent more than $400 million to knowledge based businesses.
- The Toronto Dominion Bank offers a number of financing programs for knowledge based companies. The bank will even offer, under some circumstances, to finance Research and Development (R&D) tax credits for companies before the tax credits are approved in Ottawa.
- The Canadian Imperial Bank of Commerce (CIBC) has 30 account managers trained in high-tech finance and has set them up in branches across the country. To help assess knowledge based companies and their products the CIBC has allied itself with several high tech organizations, including Ortech International, an Ontario think tank and R&D center. In addition the CIBC donated $700,000 to the University of Waterloo to help finance a new center for the management of technological change and entrepreneurial innovation. The center has been conducting research on financing high-tech ventures and the CIBC intends to draw on this research to refine its lending practices.
- The Bank of Montreal is focusing on financing high-tech startups. It has targeted two kinds of startup companies; producers of knowledge based products and conventional companies that rely on new

technologies when turning out traditional goods and services. The Bank of Montreal also links young companies with venture capitalists and private investors for additional capital.

- The Bank of Nova Scotia appears to be the slowest off the high-tech mark. A representative says the bank is currently hiring executives with expertise in various high-tech industries. To date, however, the Bank of Nova Scotia has not announced any major initiatives.

While it is not intended that this venture will seek bank financing in the early stages, it is anticipated that once the venture has completed the first phase of the product development that bank financing may be sought. The fact that many banks seem willing to finance high risk ventures in information technology is important as the sources of capital of the participants themselves is limited and they do not want to rely too heavily on either government subsidies or venture capital.

The venture capital market is where some initial startup capital will be sought. Through Denis, the principal that is involved in venture capital, it is hoped the funds will be available for the initial startup phase of the venture. It would appear both from comments made by Denis and recent reports in the press that there is money readily available in the venture capital market.

The "Globe and Mail" recently reported that the Association of Canadian Venture Capital Companies had almost $2 billion of venture

capital waiting for opportunities.[4] This is up substantially from $773 million in 1993 and $409 million in 1992. Actual venture capital investments last year rose 15 percent to $460 million; 296 companies got financing, 188 for the first time, expansion financing accounted for 56 percent of the total invested, up from 39 percent in 1993.

Similarly to the banks the venture capitalists appear to be very interested in investing in technology. Fifty-nine percent of the total amount invested in 1994 was in technology and 18 percent of the total invested was in computers and related technologies. The breakdown of venture investments by business types in 1994 was as follows:

---

[4] Bell, Andrew. "$1.93 billion looking for a home", The Globe and Mail, March, 1995, pp B 6.

Table 4 - Breakdown of Venture Investments 1994

Business Type	Amount in millions $	% Invested
Biotechnology	$24	5%
Communications	40	9
Computer	83	18
Electronics	36	8
Energy/environmental	32	7
Industrial automation & equipment	18	4
Medical/Health	36	8
Total Technology	**$271**	**59%**
Consumer	31	7
Manufacturing	90	20
Miscellaneous	68	15
Total Traditional	$189	41%
Total Combined	**$460**	**100%**

Subsequent to this article, the "Globe and Mail" reported on May 1, 1995 that venture capital is not for everyone. Venture capitalists are generally interested in high (35%) and speedy returns.[5] In addition many venture capitalists want a controlling interest in the firm until they exit the investment by selling off their share, generally through an initial public offering on the stock market.

It would appear that there may be other options besides personal savings for financing this venture. The government, banks and venture capitalists perceive technology as a growth area and are prepared to

---

[5] Zeidenberg, Jerry. "Venture Capital not for everyone", The Globe and Mail, May 1, 1995, pp B 7.

make funds available to either new or existing ventures in the technology industry.

Technology

This venture is based on applying the most modern technologies available. The participants in this venture perceive that one of their strategic advantages will come from being able to utilize current advancements in software development. It is therefore important to evaluate where technology is heading, what is current and what can people expect in the next few years from the software industry.

The software industry is new and evolving. Many more changes are anticipated in the next few years. According to a report prepared by Peat Marwick Stevenson and Kellogg in association with Abt Associates of Canada and IDC Canada the computer industry of the 1990s is a very different one from that of the 1980s. The report identified the following trends in computing:

- end user driven, that is, users are dictating more and more exactly what their expectations are;
- a significant migration to the use of packaged solutions;
- a significant and continuing increase in the distribution of applications and application systems;
- given this distribution and "end user" orientation, an increased use of communications, both local and wide area;
- a continuing trend to outsourcing of new applications;

- continuing development of better tools for systems development.[6]

In addition the report found that the large hardware-oriented firms are in decline. The report says that hardware is becoming more and more of a commodity as standard platforms evolve to take the major share of the market. The new giants in the industry, according to the report, are either commodity oriented hardware suppliers or software products and services companies. In addition many small niche oriented companies are emerging. This is partly related to the fact that through new forms of distribution customers are increasingly buying systems from a multiplicity of vendors. The authors of the report felt that these changes reflected a certain maturing of both technology capability and of users' understanding of the technology and its capabilities.

The maturing of users' understanding of technology can be partially attributed to the huge growth in the use of personal computers (PC's), both at work and in the home. According to an advertising supplement in the "Globe and Mail", consumers now spend more on PC's than on TV's and VCR's. In the business environment the move towards personal computers has been driven by the availability and ease of use of software that operates on PC's, the lowering of costs associated with PC's and the emergence of client server technology.

---

[6] Ministry of Employment and Immigration, "Software and National Competitiveness", Employment and Immigration Canada publication, March 1992, pp 14.

Client Server technology has recently received a great deal of attention. Client Server is a particular type of distributed system where the processing power is distributed between a central server computer, such as a mini-computer or a powerful workstation and a number of client computers, which are usually PC's. The split in responsibilities between the server and the client varies considerably from application to application, but the client often handles data entry and the immediate output, while the server maintains the larger database against which new data is processed. The advantages of Client Server are greater access to corporate and external data, lower processing costs, reduced maintenance costs and greater flexibility

Client Server is one of the more dominant changes in technology infrastructure. The authors of *Managing Information in the Future* see six other large developments in infrastructure.

- A decline in the use of mainframe systems but a continuation of their use for various applications. The installed base of mainframes and their ability to process large numbers of data intense transactions in an efficient manner make then an ongoing valuable resource to many organizations.
- Supercomputers will focus more on the integration of many high-speed processors operating in parallel. This will allow them to divide an application program into parts that are processed simultaneously and then to reintegrate the results. It is anticipated that as this technology evolves, it will be able to place a machine processing the same capabilities as today's supercomputers on a desktop.

- Faster and smaller processing chips will continue to be developed. There is theoretically still the opportunity for significant improvement in size, speed and number of transistors that can be placed on a silicon chip.
- The products from different vendors will become better able to communicate with each other. Standards for data transmission are becoming more uniform and accepted. The reason for this is that no single vendor can provide the whole range of hardware or software deemed desirable by a customer. Those vendors who can produce products possessing the ability to share information with the products of other vendors stand to benefit in the long run.[7]

There are also many advances in software development that will affect the types of software produced and the speed with which it is introduced. The future changes as viewed by the authors of *Managing Information Technology* are outlined below:

- Future programming languages will have embedded expert systems, this will facilitate the proliferation of user developed software. In addition future programming languages will incorporate many present capabilities into integrated packages that will be powerful but flexible enough to suit the needs of a variety of non-technical user-developers. There will be more natural interactive/response prompts and instructions and many languages will support the use of voice input.

---

[7] DeHayes, Daniel W., Hoffer, Jeffrey A., Martin E., Perkins, William C., *Managing Information Technology*, MacMillan Publishing, Toronto, 1994, pp 693-694.

- More advances will be made in the area of "user friendly" applications. There will be a greater and greater use of graphical user interfaces (GUI). Multimedia applications will become easier to use and integrated into the majority of workstations.
- Virtual reality will become more prevalent as a tool for industrial development, design and testing that goes far beyond the now familiar computer assisted design applications.[8]

In summary the major changes in technology are a move away from mainframe systems to Client Server and other distributed systems. For the user there will be an increasing amount of visual and other aids such as sound and voice, to make software more user-friendly. And finally an increasing amount of expert type logic built-in to many standard software packages. This venture would appear to be following the current trends in the industry by employing Client Server technology, a graphical user interface and expert type logic.

Characteristics of the Industry

The computer industry is characterized as being cut-throat, fast paced and extremely competitive. However as peoples' knowledge and familiarity with computers grows, so does the demand for computer applications and hardware. This has brought many new firms into the marketplace. Whether or not a firm is successful will depend on many

---

[8] DeHayes, Daniel W., Hoffer, Jeffrey A., Martin E., Perkins, William C., *Managing Information Technology*, MacMillan Publishing, Toronto, 1994, pp 696-697.

factors. It is not the product alone that will determine whether or not a firm is successful. It is therefore important to establish what other parameters will contribute to the success of a firm.

In a 1991 survey of Canadian and American software companies, Coopers & Lybrand identified eight critical success factors for companies who want to achieve performance leadership over their competitors. The results of the survey are outlined below:[9]

Table 5 - Critical Success Factors in the Software Industry

Critical Success Factor	Importance
Customer service	4.8
Product Quality	4.7
Product Development	4.5
Management performance	4.3
Marketing and Sales	4.3
Human Resources	4.0
Strategic Alliances	3.6
Capital Financing	3.5

Note. The rankings were on a scale of 1 to 5, with 1 having a low importance and 5 having a high importance.

The survey also found that there was a clear relationship between marketing investment and revenue. The 35 companies who spent more

---

[9] Department of Industry, Science and Technology "A First Review of the Performance of Canada's Software Products Industry", Department of Industry, Science and Technology publication, November, 1994, pp. 4.

than the average on sales and marketing generated on average over three times the revenue of the remaining companies. On average 19 percent of revenue was spent on marketing and sales for the Canadian companies, whereas the American firms spend on average 28 percent of total revenue on marketing and sales.

The efficient and effective use of people is also an essential element in successful software companies. One of the most common measures to establish productivity is revenue productivity per employee. The software industry average is $125,000 per employee. This figure higher than the general manufacturing industry standard of $75,000 per employee. The high ratio is indicative of the importance of the human factor in the software industry.

To ensure the on-going competitiveness of their firms, many firms surveyed do attribute some importance to training. In this survey the average company provided 3.3 days per annum on training and spent an average of $562 per employee per year. Research and development was considered the most important area of training, followed by sales and marketing.

The software industry is driven by customer service and product quality. This is followed with attention to the sales and marketing effort and a concentration on staffing and training. With a burgeoning number of firms in this industry those firms that excel in these factors will be successful.

The Software Industry in Canada

The software industry presence is an important factor when considering the feasibility of a venture in information technology. Critical to the success of the venture will be the availability of qualified personnel and access to suppliers of computer hardware and software tools.

The software industry in Canada is large and well established. In 1992 an International Data Corporation study estimated sales of Canadian software products and services to be worth about $2.0 billion, made up of software products, about $1.1 billion and professional services, $.9 billion. The study also found that a significant portion, $400 million, of these products and services represented export sales.[10]

In 1992 it was estimated that approximately 150,000 people were directly involved in the development and implementation of software in Canada. This figure includes developers of software products in software companies, organizations with their own in-house development group and providers of software related services. Although there is not a comparable figure for BC specifically, it was estimated that in 1991 there were 4000-5000 people in BC employed in 250-300 BC software companies. Forty-three percent of the BC companies had less than 5 employees and about 7 percent had more than fifty.

---

[10] Ministry of Employment and Immigration, "Software and National Competitiveness", Employment and Immigration Canada publication, March 1992, pp 1.

The smallness of most BC software companies is illustrative of the newness of the industry. A 1991 survey found that half of all BC firms are less than 5 years old. Sales figures are also small. The same survey found that 30 percent of BC companies had annual sales in $500,000 to $5 million range and only 4 percent had sales in excess of $5 million.[11] However most companies surveyed were anticipating substantial growth. Almost half the companies surveyed in 1991 had projected sales growth of 40 percent and another 15 percent were anticipating sales growth in excess of 100 percent. Not all of the growth was anticipated in the domestic market, 50 percent of BC software firms depend on the international market for generating revenue.

However, among software specific companies there is a current and growing shortage of workers. Annual growth in the Canadian software industry is projected at 20%, while the number of workers available to that industry is dwindling. The traditional source for entry-level software workers, Canadian universities, are producing fewer computing science graduates. A negative image of software workers among high school students is contributing to the reduced number of people entering the software field.

In addition, a study commissioned by the government found that two-thirds of Canada's 150,000 software workers are employed as "in-

---

[11] Department of Industry, Science and Technology, "Software Developers 1992", Department of Industry, Science and Technology publication, 1992, pp. 8.

house" workers within the Management Information Systems departments of Canadian industry and government. Just when they could be most productive these workers are increasingly plateauing in mid-career, due to a critical obsolescence of skills arising from rapid changes in technology. The study also found that this skills crisis is not being addressed through training or retraining. If this is not addressed the study concluded, many groups of workers will be unable to attain employment in the software industry.[12]

As a result of the fewer entrants into university and college computer programming courses and the lack of retraining being done by people in mid-career, there are few people with both training and experience in the latest technology. According to two corporate recruiters who specialize in hiring technical computer specialists, there are not enough programmers with experience in C++ or other new graphical user interface programming tools. And there are not enough programmers with experience in expert systems. Companies are currently having to rely on small firms that will contract out people with these skills. According to the corporate recruiters it can take a company anywhere from two to six months to find someone with the appropriate skills and then the recruits are usually looking for an above average salary.

---

[12] Ministry of Employment and Immigration, "Software and National Competitiveness", Employment and Immigration Canada publication, March 1992, pp 3.

The lack of people with these skills can be viewed as both an advantage and a disadvantage for this venture. In the initial phases it will be an advantage as the proposed participants do have skills in graphical user interface tools, Object Oriented programming, expert systems and relational databases, tools that will be used when building this product. However in the long term it may pose a problem as it may be difficult to attract programmers with these skills.

The Canadian software industry would appear to be well established and healthy, with a strong growth predicted. The major concern for this venture may be the lack of workers qualified in the latest technology.

Industry Profitability

All of the direct competition of this particular venture are private companies; so it is not possible to obtain information about the profitability of specific firms. However, some information will be provided on the profitability of the computer industry in general.

The "Globe and Mail" reported on April 21, 1995, that computer manufacturers' profits were up dramatically for this quarter, ending March 31, 1995. The Globe attributed the increased profits to pent up demand for computer products and the industry's apparent success in cutting costs and developing a few home-run products. [13]

---

[13] Rowan, Geoffrey. "Computer Firms' Profits Soar", The Globe and Mail, April 25, 1995, pp. B 1.

However according to many analysts, software is where the future profits will be found. Peter Huber wrote in "Forbes", that the "PC is turning into a cash register once again, and it promises to boost many software creators up the wealth ladder".[14] He attributes this to the low capital requirements for establishing a software firm and the new ways to distribute and charge for software. Huber feels that through avenues such as the Internet, and compact disks and through relationships with computer manufacturers, software vendors will no longer have to fight with other vendors for shelf space and they will have access to much bigger markets. This coupled with the fact that many software ventures are started by a few people working in their basements with little financing will mean that many will be very successful financially.

The profitability of each venture is of course a separate issue, however, it is important to note that many people, investors, and the government perceive that software development is a gold mine waiting to be developed. Although the software industry appears to be very profitable what is not so apparent is that while many firms are successful there are many that are never profitable.

For the fiscal year ending December 31, 1993 a survey prepared by Industry Canada of 105 software firms in Canada found that the average profitability was 4 percent (net income after tax/total revenues).

---

[14] Huber, Peter. "Software's cash register", Forbes 400, 152 (9), pp 314.

Sixteen out of 101 firms were not profitable and 10 firms reported profitability greater than 20 percent. The survey also found that the average current ratio was 2.5:1 and the median rate of return on equity was 16 percent, the same as US industry figures. The average gross profit margin was 77 percent and the average sales expenditures as a percentage of total revenue was 11 percent.[15]

For information on the profitability of local computer firms a report prepared by the Ministry of Small Business, Tourism and Culture for the BC Business Service Center was reviewed. The Ministry, in association with Statistics Canada and Industry, Science and Technology Canada reviewed 118 small computer firms in BC in 1991. All of the firms reviewed had gross revenues between $25,000 and $5,000,000 for the fiscal year ending 31 December 1991. Of the firms reviewed only 59% were profitable. The average return on assets was -12.8%. The firms in the lower middle quartile, that is firms with revenues between $806,000 and $2,398,000, had the highest return on assets at 13.2%. The average gross margin was 9.6% and the average current ratio and debt ratio were 1.7 and .8 respectively.[16]

---

[15] Department of Industry, Science and Technology, "A First Review of the Performance of Canada's Software Products Industry", Department of Industry, Science and Technology publication, November, 1994, pp. 13-14.

[16] Ministry of Small Business, Tourism and Culture, "Small Business Profile", Ministry of Small Business, Tourism and Culture publication, 1992, pp. 835-837.

It would appear that many firms were carrying a high debt load, particularly those firms in lower quartiles. For firms with gross revenues between $25,000 and $806,000 their debt ratio (total liabilities/total assets) was 2.0. By most peoples' estimation these firms should be bankrupt. It is possible that with revenues as low as $25,000, some of the firms counted in the lower quartile were firms that were in the early startup phase of their operation. In addition, unlike most businesses that purchase assets such as office furniture, inventory, perhaps a building, computer firms in the early startup require very few tangible assets. The assets are the software that is developed over time.

Nevertheless the results do not appear to be promising. This may be due partially to the fact that many of the figures quoted are averages for the industry and this will include many firms that are either in the early startup phase of their operation or firms that are unprofitable. In addition the computer industry is characterized as high risk and there will be many firms that are not successful. This can be attributed to many factors:

- the speed with which technology changes;
- the long development cycle coupled with the fact that at the time the product is finally launched there may be many other competitors already on the market;
- the low barriers to entry. The only major capital requirements for the startup of a new software firm are experienced software developers, a good personal computer, a printer and some development software.

This means that there may be many entrants to the same market, making competition very fierce;

- the low barriers to exit. The ability to start a venture with little capital also means that there will be fewer barriers to exiting the venture. The major investment for most new ventures in technology is time and if the venture is not successful it is easy to walk away. In addition there are a lot of employment opportunities for programmers and analysts with current skills so if the venture is not successful the technical people may not have any difficulty finding re-employment.

Chapter III
Marketing Analysis

Introduction

The marketing analysis includes a examination of the customers, the competition and the market. The marketing analysis has been done through a review of the literature available on medical informatics and medical office systems, a survey of nine vendors who currently operate in the market and a survey of 50 physician practices around BC.

Customers

The customers for this product are physicians as they will make the purchasing decision. However there will be other users of the system and they may have input into the decision making process. The other users of the system include medical office assistants and possibly nursing personnel employed by the physician. For patient registration, patient scheduling and patient billing the medical office assistant will be the primary user. The physicians' primary interest in this aspect of the system would be that the billing is done correctly and in a timely manner and that patients are scheduled for the appropriate times allotted.

The role of the medical office assistant is to handle the telephone and reception area, make appointments, do word-processing, file the patient charts and do the billing. Most medical office assistants have received training prior to employment in a physician's office. Their

training is usually an academic year and covers some computer training as well as records management, introductory accounting, medical office procedures, medical terminology and medical transcription. The entrance requirements into the program are Grade 12 English and Math 10 with a C or better grade. In addition the applicant must be able to type 35 words a minute with less than 5 errors.

Not all physician practices would have a nurse assistant. If the practice did employ a nurse they would use the patient registration, patient scheduling and charting functions. The role of the nurse in the physician's office is to assist the physician with basic medical procedures and exams and to assistant the medical office assistant with administrative functions. A nurse who works in a physician's office may be qualified as a registered nurse or a practical nurse. A practical nurse has two years of training at the college level. A registered nurse may take a college program or a university program. These programs are generally four years in duration and include many practicums in hospitals and clinics.

Physicians have a minimum of three years undergraduate work, four years in medical school and one year of internship. During their training they do not receive any advice or skills training in practice management or computing. In their training they may have had exposure to a physician's practice during one of their practicums but any information they obtain on practice management is on their own initiative.

Physicians could be characterized as intelligent, well educated and highly motivated. Generally physicians are concerned with quality. Price is not the dominant factor in purchasing decisions. This is evidenced by the fact that one of the vendors, Osler, has the major market share but is also the most expensive. In addition many physicians have extremely busy schedules and they want information and services quickly and efficiently.

However despite their education and training, physicians, according to the "Canadian Medical Association Journal", have been one of the last groups to get on the information highway.[17] Recently, however, physicians have been pushed into the technological age.

The pressure to computerize has come from Ministry of Health requirements, financial pressures and time pressures. The latest push to move to a more automated environment has come, however, from the physicians' own recognition that it is almost impossible to stay on top of the explosion of information that is available to them. According to the "Canadian Medical Association Journal", high speed computers and computer networks are shifting the burden away from learning facts to a stronger focus on learning processes. Many physicians are now using personal computers to access extensive medical databases to assist them in keeping current with medical advances. The Canadian Medical

---

[17] O'Reilly, Michael, "Health care begins to merge with the information highway", Canadian Medical Association Journal, 151 (8) pp. 1173-1176.

Association was the first national medical association to provide interactive health information on the World Wide Web.

The Medical Association's multi-media system provides access to comprehensive detail on health policy, ethics, medical economics, and what is new in health care. In addition the service allows on-line conferencing for physicians to share views and concerns as well as question and answer forums for the public.

As a result of all of these developments there has been an increasing interest amongst the medical field about computing and what computing can do to assist physicians in their daily routines. In many countries, including Canada, there are medical informatics groups that have evolved through a recognition by physicians that computers will play an increasing role in their practice. At a medical informatics conference, the plenary speaker, Jeremy Nobel of Harvard University stated that "well designed information systems will be the new central nervous system for healthcare delivery."[18]

Physicians are particularly interested in the electronic medical record. It is anticipated that not only will the electronic medical record bring many efficiencies to a medical practice but to the entire delivery of healthcare. According to a recent article in "Healthcare Financial Management" the electronic medical record can provide benefits beyond

---

[18] Ball, Marion J., Douglas, Judith V., Silva, John S., "Toward the healthcare professional workstation", Computer in Healthcare, 14 (10), pp. 27-29.

the obvious functions of efficient and less labor-intensive scanning, archiving, retrieving and printing of patient care information. It is believed that the electronic medical record will save money, enhance operations and improve the quality of patient care throughout a healthcare facility or region.[19]

In a healthcare facility or region the objective of the electronic medical record is to provide clinical information surrounding the patient to any medical personnel who may require it. This would include, for example, the patient's family physician and the emergency physician seeing the patient for the first time. There are already experiments in tele-medicine, where the patient's clinical information is linked electronically. Eight small rural hospitals are tied through high speed networks to a regional medical center in Lawton Oklahoma. Using video links and computers, specialists at Lawton read x-rays, conduct heart exams and even do psychiatric tests for these small hospitals. This eliminates some of the requirement for patients to travel into large centers for diagnostic and other tests.

In Scotland a new state of the art hospital has been built that has as its foundation a patient care strategy that will convey patient information to specialists around the world. The objective of the hospital is to care for patients from remote and under-developed regions of the world where advanced medical care is not available. However before the

---

[19] Davis, Michael, "Reaping the benefits of electronic medical record systems", Healthcare Financial Management, 47 (6), pp 60.

goal of worldwide consulting capabilities could be accomplished the electronic medical record had to become a reality. The facility was built to accommodate the electronic creation, transmission, amendment, storage and retrieval of patient records. None of the usual physical plant design to generate and store paper records was incorporated into the design. Rather patient information is captured electronically at all points of care within the facility. Patient medical information is then available during admissions, at the bedside, in ancillary departments, operating theaters, in physician offices and homes.

It is this type of technology that has many people believing that information technology, particularly the advent of the electronic medical record, borders on the fourth revolution in medicine. At the HIMSS '94 (Health Information and Management Systems Society) conference Jim Reep, a keynote speaker, said that the electronic medical record is creating a revolution that's taking a fragmented independent-practitioner medical industry and turning it into an integrated delivery system.[20] HIMSS is a 4200 member association of health care information management specialists . According to Marshall Ruffin, in a paper published in "Healthcare Forum", the computer based medical record will be the integrated healthcare system's most valuable asset.[21]

---

[20] Hagland, Mark, " HIMSS '94", Hospitals and Health Networks, 68 (3), pp 42.

[21] Ruffin, Marshal, "Medical Informatics", Healthcare Journal Forum, 36 (2) pp 47-50.

The impetus for the implementation of computerized records is coming not only from physicians themselves but from government and other funding agencies. The Clinton healthcare reforms originally included the conversion of all hospitals participating in Medicare to a computerized patient record by January 1, 1996.[22] That goal has since been considered unrealistic, however there is still alot of interest by the US government in the advent of a computerized medical record.

The US and Canadian governments' interest in the electronic medical record is for two reasons. Both governments hope that by having patient results and diagnoses on line that expensive diagnostic tests will not have to be repeated as the information will be able to be shared between physicians. Both governments also want to eliminate abuse of the healthcare system. By having the electronic medical record available to emergency room physicians as well as, for example, the family physician, patients will not be able to as readily doctor hop and get more than the accepted amount of prescription medications and treatments.

The Provincial government of Prince Edward Island has already started the implementation of a province wide registration system. It is envisaged that this system will be the beginning of an electronic medical record that is shared between hospitals and physicians. Other provinces

---

[22] Cornelius, Mark, "Why endure frustration? Medical records need cooperative overhaul." Modern Healthcare, 23 (9), pp 33.

such as BC and Ontario are investigating similar options for the sharing of information between health regions.

However it is not only the government that is pushing physicians to computerize their medical practices. According to the President of the American Society of Internal Medicine, "the demand for electronic data by physicians, hospitals and insurers will continue to grow with or without prodding from lawmakers".[23] In a physician's own practice an electronic medical record will have the following benefits:

- less storage space requirements. A physician must keep patient medical history information on file for seven years after patient discharge. This requires an immense amount of storage space for the average physician who will have anywhere from 4000-5000 patients.
- access to the record from anywhere. Through modem access, a physician with a laptop personal computer could access a patient's information from home, from the hospital or from another clinic. The advantages of this are that the physician may have less traveling time to and from his office and the patient's information is available at any time.
- better patient care. It is the intelligent or expert system side of the electronic medical record that will have the most benefits. Expert logic will assist the physician with prescribing drugs, checking lab

---

[23] Betts, Mitch, "Doctors prescribe software for patient record woes", Computerworld, 28 (8), pp 48.

results, ensuring follow-up is done, and monitoring treatment regimes against physician care plans.

The automation of the drug prescription process should, according to most physicians, decrease the likelihood that the patient will receive the wrong drug or the wrong dosage. The system will check for drug contra-indications rather than the physician having to flip through the chart looking for previous prescriptions and then checking this against the pharmaceutical guide.

The on-line electronic medical record will allow physicians to receive information electronically from outside diagnostic systems, such as a Lab. The patient's chart will be more quickly updated and any unusual results can be brought to the physician's attention immediately. Follow-up notices and treatment reviews will be generated automatically by the system. This should help to ensure that patients are reminded about follow-up visits and checkups.

Care plans are treatment plans for certain diseases or conditions. Care plans include the types and amounts of drugs, other therapies such as physical therapy or occupational therapy and the types of investigations that might be appropriate such as Lab tests or radiology examinations. The care plans have a dual purpose of ensuring that the patient receives the appropriate treatment for his/her condition and as a yardstick against which physicians practices are measured. Care plans provide physicians with information on the accepted treatment regime for a particular illness or condition. There are no expectations however that

physicians will always follow a care plan as each patient is treated as an individual. By having careplans on-line in a medical office system physicians can refer to them as required and compare their practice to what has been documented as appropriate.

Vendors, however, have been slow to provide electronic medical records, according to an article in "Healthcare Financial Management".[24] The author says that vendors have been slowed by the cost and limits of technology but as a result of recent developments in technology these constraints have been lifted. Microsoft is one of the latest entrants into the medical software field. Bill Gates was one of the keynote speakers at the HIMSS '95 conference. His interest lies in connecting medical personnel with patient information irregardless of where the information is stored. As part of this strategy Microsoft has 200 solution partners and other third party arrangements with healthcare information vendors.

Until recently electronic medical record systems have concentrated on storing the text and image files that represent the paper documentation in the medical record using an optical storage method. This required that hospitals and medical practices have large optical archive storage devices and scanning workstations. The move now however is to automate the entire medical record and store the individual order and results as records rather than the paper version of the record.

---

[24] Davis, Michael, "Reaping the Benefits of the Electronic Medical Record", Healthcare Financial Management, 47 (6) pp 60.

Although electronic medical records systems are not currently in widespread use, it is anticipated that this will change rapidly in the next few years. At the HIMSS '93 Conference half of the attendees surveyed anticipated the implementation of computerized records in their healthcare facility within the next five years.[25] A 1994 survey conducted by the journal, "Health Management Technology", found that 29 percent of the respondents had implemented computerized medical records in some form.[26]

However the implementation of electronic medical record keeping is not limited to large healthcare facilities. A 1995 study found that more than 2/5 group medical practices are expected to use computers for medical record keeping by 1996.[27]

In summary, the physician, as a computer user, could be characterized as maturing. The physicians' needs and their knowledge about computer systems are rapidly becoming more sophisticated. They will be looking for a strong and reliable products that will allow them the flexibility to move with the current advances in medical information technology. These products will incorporate expert logic, be powerful

---

[25] Lumsden, Kevin, "Computerized patient records gain converts", Hospitals and Health Networks, 67 (7) pp 44.

[26] Lohman, Philip and Sundeen, Maria, "Survey results indicate CPR is making headway", Health Management Technology, 15 (11), pp 41.

[27] Unknown, "Groups crowd the on-ramp for the information superhighway", Medical Economics, 72 (5), pp 170.

enough to allow for extensive medical databases and they will be built using technology that provides for integration with other systems. The integration aspect will be particularly important for accessing patient clinical information. However technology will not be the only determining factor in purchase decisions, physicians will also be looking for reliable and efficient customer service.

The Competition

For information on the competition nine vendors were surveyed. They were asked a standard set of questions about their company, the product that they offer, price, and future plans. The vendors surveyed were a cross section of small and larger vendors who are well established in the market.

The competition in this market is primarily in segment one and segment two. Most of the vendors have entered this market in response to the requirement that physicians have software that will interact with the Ministry of Health Teleplan software. According to a Ministry of Health official the majority of vendors who supply software for this market have the following characteristics:

- They provide only one product.
- They are small, perhaps with only one or two full time employees.
- The person or persons who started the venture have some relationship to the medical field. For example many of the software companies were started by physicians or by spouses of physicians.

- The software supplied by these vendors while functional, is relatively unsophisticated and it is rapidly becoming out of date in terms of current standards. None of the vendors provide true Windows based applications. While most of the systems will run in Windows they are predominately character based and do not utilize a graphical user interface. A graphical user interface is particularly important in a charting module because of the complexity of the functionality. Physicians have expressed reluctance in using a charting module that is cumbersome and will be slower than writing on a chart.

  In addition the systems currently being offered are limited in terms of the flexibility as they do not allow for true multi-user functionality, their database and file formats are sequential as opposed to relational, and they are reliant on DOS.

  With the release of Windows '95 (Chicago) DOS based applications are eventually going to be superseded. Windows '95 incorporates DOS and Windows into one operating system. Currently Windows is a layer on top of DOS, this constrains the usage of memory and does not allow for true multi-tasking. Windows '95 is based on a 32 bit architecture which will improve memory usage for Windows based applications.

To maintain DOS based applications vendors will be required to use old PC's, as eventually all new PC's will be released with Windows '95. According to the "Computer Paper", at least 75 independent hardware vendors will soon ship plug and play devices for Windows '95, and at least 53 independent software vendors are expected to ship applications for Windows '95 shortly after its launch.[28] In addition physicians purchasing new hardware may be somewhat constrained by the older software as the software may encounter operating problems if they try and run their applications under Windows '95 if the software has not been converted.

- Their client base is small and geographically focused on an area such as the lower mainland, Vancouver Island, the Okanogan etc. The reason for the geographical dispersion is cost. Vendors have located close to their client base to keep support and training costs to a minimum. Due to the lack of sophistication of some of these products the vendors are only able to support their client by either telephone or by personally visiting the physicians' office. Remote support by modem is not done by any of the vendors except Osler.

Training costs are the other reason for the geographical dispersion. Several of the vendors provide training as required, generally in the physicians' office. Only Osler provides training as a part of the purchase price. However even the training provided by Osler is not extremely extensive. The training is generally for 2-2.5 hours and

---

[28] Wheelwright, Geof, "Microsoft Win 95 Strategy Courts Corporations", The Computer Paper, August '95, pp 20.

covers system functionality only, it does not include the technical setup of the hardware. Osler also trains in physician offices. In an attempt to keep costs to a minimum Osler tries to schedule several clients in the same area for the same time period. Osler is located in Sidney, not far out of Victoria and so clients, for example, in the northern part of Vancouver Island are scheduled for training in the same week.

Providing training to clients outside of the local area is however, extremely expensive. Even if two clients in Campbell River, for example, were scheduled for the same week the costs to provide two days of training would include:

Table 6 - Sample Training Expenses

Expense Item	Cost
Mileage @ $0.26 a km	$54.00
Hotel - one night	$100.00
Meals - 3 meals for 2 days	$96.00
Incidentals - 2 days	$20.00
Salary @ $65.00 an hour	$975.00
Total	$1245.00

This cost estimate includes the cost of training two clients in the same general area but even allowing for some rationalization of the cost it is expensive. The product itself only sells for $1295 so by providing training Osler has effectively eliminated much of their profit margin. If the travel involved airfare costs as well, the margins would be even more substantially affected. As a result of the cost of training, vendors have concentrated their sales efforts in geographically proximate regions leading to the geographical fragmentation of the market.

It is not possible to obtain information on exactly how many vendors there are operating in this market due to the geographical dispersion and the small size of some of the vendors. An employee with the Ministry of Health speculated that there might be as many 30 vendors. There are, however, seven older and more established vendors supplying medical software in BC. These vendors have a broad client base and may provide more than the one product. All of these vendors belong to the Medical Software Vendors Association; an association first initiated by the government to ensure that there was a forum where they could communicate requirements and changes to the Teleplan software. All seven of these vendors were surveyed and the following information was obtained:

1.

Company Name	Clinicare Corporation
Company Address	Calgary, Alberta
Software products	Laboratory systems, pharmacy systems, and medical and dental practice systems
Software features	Systems built for large multi-member offices
Software price	N/A
Type of support provided	N/A
Future plans	N/A
Other information	15 employees, sales $1.5 million in 1992. Only interested in large practices as the price of the software is prohibitive for a small practice.

2.

Company Name	Datran Clinical Support
Company Address	Vancouver, BC
Software products	Practice Management Software
Software features	Patient billing, appointment scheduling, patient recall, and practice statistics.
Software price	$940
Type of support provided	Regular support: Software updates, telephone helpline, $550.00 per annum. Deluxe support: same as basic plus remote diagnostic support, training of new staff as required, consulting services as required, on-site support as needed, preventative maintenance, Wordperfect and Simply Accounting support. $1100 per annum plus $10 surcharge per call if outside Vancouver.
Future plans	N/A
Other information	N/A
Bureau services	Yes. Forms are provided by the Bureau, the physician is responsible for all pickup and delivery costs
Bureau price	$0.22 per claim, $0.12 per additional claim for same patient, same day, $0.07 for each new patient registered, $0.25 per page for regular accounting reports, $1.00 per page for special request reports.

3.

Company Name	Dialog Medical Systems
Company Address	Vancouver, BC
Software products	Medical and dental practice systems
Software features	Patient billing,
Software price	$1195
Type of support provided	Telephone support during regular office hours, regular upgrades, $500 per annum
Future plans	Interface to AcCobalt
Other information	Six employees, 45% of clients are physicians, 55% of clients are dentists, approximately 200 physician practices as clients, in business since 1986.
Bureau services	N/A
Bureau price	N/A

4.

Company Name	Genie Computer Systems
Company Address	North Vancouver, BC
Software products	Medical practice software
Software features	Patient billing, patient recall, inactive patient follow-up, integrated letter writing, healthcare card swipe, appointment scheduling.
Software price	$1150
Type of support provided	On-site service
Future plans	N/A
Other information	Offices in Toronto, Calgary and Vancouver, 350 clients across Canada
Bureau services	N/A
Bureau price	N/A

5.

Company Name	Osler Systems Management
Company Address	Sidney, BC
Software products	Billing Manager/Practice Manager
Software features	Patient billing, patient scheduler, medical records, reminders, patient recalls, surgery waiting lists, surgery bookings, practitioner's out of office schedule
Software price	Billing Manager $1295 plus $600 for two optional modules. Practice Manager $2995.
Type of support provided	Toll free support line 9am-5pm Monday to Friday. One to two updates annually. Initial purchase price includes 2-2.5 hours training.
Future plans	N/A
Other information	Largest client base with 2100 physicians and 60 small hospitals.
Bureau services	N/A
Bureau price	N/A

6.

Company Name	Intermedic Services
Company Address	Victoria, BC
Software products	Medical Practice Software
Software features	Patient billing, patient notes, walk in clinic record, patient cover sheets, appointment scheduling, patient statistics, patient recall, link to Microsoft Word
Software price	$1395 for basic module, $350 for Office Chart Management, $249 for User Fee Module, $249 for Patient Statistics, $495 for Scheduler, $249 Patient Recall.
Type of support provided	Toll free helpline open from 9am to 5pm seven days a week
Future plans	Voice recognition software and hardware for transcription and integration with other packages
Other information	Custom software development. Leasing options available
Bureau services	Yes.
Bureau price	$0.32 per claim or a minimum of $30 per month.

7.

Company Name	PS Regent Health Care Systems
Company Address	Langley, BC
Software products	Medical Practice Software
Software features	Patient billing, patient recall, family groupings, colour display
Software price	$1250
Type of support provided	Toll free helpline available 8:30am - 5pm Monday - Friday. $550 per annum.
Future plans	N/A
Other information	Division of West Coast Drugs. 800 software sites.
Bureau services	Yes.
Bureau price	$0.30 per claim

In addition to the companies that currently provide patient billing software there are two companies that may be serious competitors in segment three, the paperless patient chart. One of these companies is local while the other company is based in Anjou, Quebec. The local company was previously involved in providing billing software but they have decided to concentrate solely on providing software that will reduce the paper flow in the general practitioner's office. Neither of the vendors currently have any sites with this software installed. Both vendors are currently in the prototype and beta testing stage and they plan to have the software available later this year.

8.

Company Name	Compro Medical Software
Company Address	Nanaimo, BC
Software products	Medical Practice Software
Software features	Patient registration, full medical records using SOAP codes, appointment scheduling, electronic inter-office mail and link to third party billing system
Software price	$375
Type of support provided	Remote support via modem
Future plans	N/A
Other information	Company owned by physicians and the system is designed by physicians. Plans to have 55 physicians using the system soon.
Bureau services	N/A
Bureau price	N/A

9.

Company Name	Developpment Purkinje inc.
Company Address	Anjou, Quebec
Software products	Medical Practice Software
Software features	Access to drug interactions, patient billing, on-screen receiving and viewing lab results, electronic notepad.
Software price	$5,000
Type of support provided	1 hour of training, $75
Future plans	N/A
Other information	Founded in 1978, 60 employees, 200 physician researchers, 40 expert consultants, R&D 1994/95 $11 million
Bureau services	N/A
Bureau price	N/A

Although there appears to be a great deal of competition, in fact there are only a few companies that pose a serious threat. In the area of patient billing, Osler Systems is the strongest in the market. They have the broadest client base, with approximately 40 per cent of the BC market. This rate of market penetration was given by Osler themselves and confirmed by the marketing survey.

According to many physicians the reason for Osler's success is their strong product and customer service. Osler's product is however the most expensive of the vendors that were surveyed, and two of the standard modules are an additional cost. In addition the technology that Osler employs is out of date. The database structure is B-trieve and the frontend is DOS based. To move to a more modern client server configuration with a relational database and GUI frontend would require a re-write of the entire system.

Osler also does not provide a charting module and they have no plans to provide this in the future. By not providing this functionality Osler is limiting their future potential sales. As noted in the previous section, the electronic medical record is fast becoming a important part of healthcare delivery and many physicians will be looking for this option. Even if Osler did decide to provide a charting module they are constrained by the technology that they are using. Charting requires a graphical user interface because of the complexity of the functionality in the module.

A re-write of the Osler system would be a development project that is equivalent to the development project proposed by this venture. It is doubtful whether Osler could produce a product that includes a GUI frontend and a relational database in anything less than a year. This is of course contingent on the fact that they have employees with the appropriate skills and the time to undertake such a project. In addition once the program has been developed Osler would have to consider the cost of re-training and converting their existing clients. Although in the long run it could be a wise investment decision in the short-term their outlays could be substantial. An estimate of this could be 2-3 hours training at $65 a client times 2100 clients is $409,500. This is the salary cost only and does not include the cost of travel or the cost of preparing the training or converting the client's database. In addition it does not include the cost of the actual development project.

There is no evidence that Osler is considering such a big investment. When questioned as to their future plans Osler responded that they were planning enhancements to some of the existing modules but nothing more. Osler gave the impression that they felt their position in the market was secure and that a major upgrade of their system was not required.

The other potentially strong competitor for the Charting Module is Developpment Purkinje from Quebec. Although the company is still in the beta testing phase, the literature on the product does promise to offer much of the same functionality that this venture will offer. The focus of Developpment Purkinje is the paperless chart, although they advertise that they will also provide patient billing. Using a pen-based portable computer Developpment Purkinje promises to offer fast entry of medical observations, readable charts, drug interactions, automatic transfer of laboratory results, quick access to multiple data banks and direct printouts of patient's prescriptions.

In addition the Developpment Purkinje promises to offer client server technology, there is no mention about the database structure but the frontend will be GUI and Windows compliant. Developpment Purkinje also boasts extensive R&D financing and a large staff, including many physicians.

The major difference in product functionality between Developpment Purkinje and the proposed venture is the issue of portability. As mentioned earlier physicians may be reluctant to go to

the expense of installing a PC in every examining room, in addition a PC takes up alot of space and space is at a premium in many examining rooms. Developpment Purkinje's solution is to offer portable pen-based computers. These are essentially the same size as a standard laptop computer the only difference is that the keyboard may not necessarily be used. A light pen is used to either write directly on the screen or pick items from the screen. This venture proposes instead of a portable computer using a Zenith Cruise Pad.

The Zenith Cruise Pad is smaller and cheaper than the portable computer. In addition the Zenith Cruise Pad is linked to the main server using radio links whereas the Portable Computer is an independent workstation and information must be downloaded from the main server to the Portable Computer and vice versa. This means that information on the Portable Computer is not available real time and there is the labor intensive aspect of downloading and uploading information. With the Cruise Pad everything is available real time and the physician can move freely about the office area.

In addition the Developpment Purkinje product is as yet untested and unproven and in their literature they make a point of asking for physicians who would like to act as a beta site. A review of their marketing literature by the author also revealed an apparent lack of business knowledge. There is no mention of how support would be provided or the type of maintenance agreement that is standard with the software.

In BC support is a fundamental issue to the physicians. This is evidenced by the amount that most physicians are willing to pay for support, on average $550 a year. The other evidence that suggests the importance of support in BC is the fact that many vendors' complete strategic advantage comes from being close to their clients and being able to provide on-site support. Developpment Purkinje may also not have knowledge about the BC environment. Each province has different rules and regulations surrounding patient billing and a lack of knowledge about local requirements could be a major stumbling block for a vendor.

A review of the hardware requirements for the Developpment Purkinje System by a technical specialist also revealed that the setup is expensive and complex. The setup calls for a single physician to have a pen-based portable computer, $3600, a Compaq personal computer $2700, a printer $485 and the software, $5000. This totals $11,785 for a single user. The major cost difference between Development Purkinje and the setup required by this venture is the pen-based portable computer. Instead of a pen-based portable computer this venture is proposing a Zenith Cruise Pad, approximately $1800. The comparable startup costs for a single physician using the software proposed by this venture would be a Zenith Cruise Pad, $1800, a generic personal computer, $2500, a printer, $400 and the software, $4400, for a total of $9100. The difference in start-up costs is almost $2700.

Development Purkinje is also restricted to Compaq hardware. This limits their market considerably because while Compaq is a well-known PC producer, a site who already has purchased PC's for the office would

not want to go to the expense of replacing everything with Compaq. The only hardware restriction for the software proposed by this venture is the Zenith Cruise Pad. The restriction is not due to the software but to a lack of vendors supplying this type of product, however it is possible that other vendors will soon be on market with similar products.

A recent article in "The Globe and Mail" discussed the importance of portable technology.[29] Apparently portable technology is now a huge focus in the computer hardware industry and this is driven entirely by consumer demand. About half the Canadian workforce now use mobile equipment such as laptop computers, handheld devices and cellular phones as part of their workday. This huge demand means that computer hardware companies are rushing to be the first to the market with smaller and more sophisticated equipment.

The issue of portability is therefore an important one. It is not unrealistic for the principals of this venture to anticipate that by providing their software in a portable manner that they will gain a strategic advantage. In addition the market appears to be demanding advancements in this area so it is conceivable that there will be important technological gains in this area in the near future.

The competition for products similar to the one proposed by this venture is minimal. The major advantage that Osler has is their strong

---

[29] Tym, Peter. "Portable Technology", The Globe and Mail. July 4, 1995, pp C1.

hold on the market. However it is likely that as Windows based computing becomes more the norm Osler's position as a provider of a strong product may be jeopardized. Developpment Purkinje would also appear to be a strong competitor on the basis that they currently have a product available that will provide similar functionality to the one proposed by this venture. However they are tied to a particular technology and they based in eastern Canada with no presence currently in the west.

What is not known is what competition may appear in the next 12 months. As mentioned earlier in Chapter Two, there are very few entry barriers to software companies and it is possible that there are companies ready to launch a product in the very near future similar to the one proposed by this venture. This makes the timing of the venture critical. Although there would appear at this time to be little in the way of competition it is impossible to anticipate what may become available and this could jeopardize the feasibility of this venture.

Marketing Survey

Fifty physician practices were surveyed for information on their vendor of choice, satisfaction with their vendor and their level of interest in other features not currently offered by their vendor's product. The physicians were asked the following questions:

Table 7 - Marketing Survey Questionnaire

QUESTIONS
• What billing/office system are you currently using?
• How long have you been using it?
• Are you currently looking for a new billing/office system?
• If the answer to the above question was yes the respondent was asked why they were looking for a new system.
• Does your system have the following components:
• billing?
• scheduling?
• charting?
• If the answer was no to any of the three options the respondent was asked if they would be interested in purchasing one of those components?
• On a scale of 1-5 with 5 being high how would you rate the functionality of your system?
• On a scale of 1-5 with 5 being high how would you rate the service from your vendor?
• How many upgrades do you receive from your vendor annually?

The 50 physician practices that were surveyed were taken from the BC Medical Association Directory. To achieve a province wide sample physicians were sampled in the following centers:

Table 8 - Location of Physician Practices Surveyed

Location	Number of General Practitioners	Number of Specialists
Inveremere	1	0
Victoria	3	3
Vancouver	7	5
Prince Rupert	2	0
Surrey	1	1
Squamish	1	0
Stewart	1	0
Revelstoke	1	0
Prince George	2	1
Kelowna	2	0
Nanaimo	1	1
Courtenay	2	0
Duncan	1	0
Port Alberni	1	0
North Vancouver	0	2
Maple Ridge	1	0
Abbotsford	2	0
Burnaby	2	2
Burns Lake	1	0
Campbell River	1	0
Delta	2	0
Total	35	15

The different centers were chosen so as to have a sample of small and large centers and to include Vancouver Island, the Lower Mainland, the interior of BC and Northern BC. Seventy percent of the physicians sampled were General Practitioners and the remainder were specialists. This was designed to be representative of the ratio of General Practitioners to Specialists.

Survey Results

The results from the survey are as follows:

Table 9 - Marketing Survey Results

Question	System Utilized	Response
1. What system are you currently using?	Osler	21
	Phoenix	8
	Bureau	4
	Stratevarius	4
	Exen	4
	Medware	4
	Dialog	2
	Clinicare	2
	Co-star	1
2. How many years have you been using your system?	Osler	5.5 years
	Phoenix	5 years
	Bureau	7 years
	Stratevarius	2 years
	Exen	5 years
	Medware	6 years
	Dialog	6 years
	Clinicare	2 years
	Co-star	15 years
3. Are you currently looking for a new system?	Osler	21 no
	Phoenix	5 no, 3 yes
	Bureau	4 no
	Stratevarius	4 no
	Exen	4 no
	Medware	2 no, 2 maybe
	Dialog	2 yes
	Clinicare	2 no
	Co-star	1 no
Does your system have the following components? • Billing (B) • Scheduling (S) • Charting (C)	Osler	B / S
	Phoenix	B / S
	Bureau	N/A
	Stratevarius	B / S
	Exen	B / S
	Medware	B / S
	Dialog	B
	Clinicare	B / S
	Co-star	B / S / C

If the answer to the above question was no, respondent asked if the would be interested in purchasing one of the components?	The general response to this question was that they would be interested provided that it was easy to install and use and could prove that it would make their office more efficient.	
On a scale of one to five, five is high, how would you rate the functionality of your system? (average of responses reported)	Osler Phoenix Bureau Stratevarius Exen Medware Dialog Clinicare Co-star	4 3.75 N/A 3 4.5 5 2 5 4.5
On a scale of one to five, five is high, how would you rate the service from your vendor? (average of responses reported)	Osler Phoenix Bureau Stratevarius Exen Medware Dialog Clinicare Co-star	4.7 3.75 N/A 3 3 4 2 4 3
How many upgrades do you receive from your vendor annually?	Osler Phoenix Bureau Stratevarius Exen Medware Dialog Clinicare Co-star	2-3 1-2 N/A 1 1 1-2 0 1-2 1

The Market

The market for this venture is very specifically physician practices. In addition the venture is currently only considering physicians in British Columbia, although there are plans for future expansion into Alberta and other provinces. Only physician practices are considered as a large number of physicians operate in a practice with other physicians. Therefore it is not possible to consider that the total number of physicians within the province equates to the total market size.

The market for this product can be broken into three segments based on the purchase requirements of the physicians. The modular nature of the product allows physicians to purchase one or more of the modules. This means that physicians that already have an office system may just purchase the Charting Module. The three segments are as follows:

- physicians new to the province of BC who are establishing their own practice or taking over an existing practice and they either do not have any office software or they wish to replace the existing system.
- physicians who are already established in a practice but are looking for a replacement office/billing system.
- physicians who are already established in a practice but are looking for a patient charting system.

Segment One and Two are closely aligned as they both relate to the purchase of an office system. The difference between the two is whether the physician is purchasing an office system for the first time because of a change in their work situation or whether they are replacing an existing system because of dissatisfaction with that system. Segment Three is differentiated from the other two on the basis that there are no physicians in the province with a fully automated charting system installed. As a result the market for charting systems potentially includes all physician office practices including physicians entering the market for the first time and physicians who are already established in their practice.

Segment One

The market segment(s) for billing/office systems is well established as all physicians practicing within BC must, due to Ministry of Health requirements, have software similar to that proposed by this venture or have retained the services of a bureau. In June 1988 the BC Ministry of Health required that all physicians bill the Ministry of Health electronically. A complete billing claim will contain the following information:

- the patient's full legal name
- the patient's BC healthcare number
- the patient's gender and date of birth
- the fee code designating the service that was performed
- the amount billed
- the ICD9 (International Classification of Diseases) code

- the date the service was performed
- the physician's billing number

In order to facilitate the billing process the Ministry of Health provided all physicians with software, referred to as Teleplan, that would send transactions containing billing information to the Ministry of Health via modem. The software also tracks the number of claims sent and validates the transactions as they are sent to the Medical Services Plan (MSP). After MSP receives the claims they validate the patient's healthcare coverage and the type of service that is being claimed. If there are no problems with the patient's coverage or the claim the physician will be paid in full.

Payments are also received electronically using Teleplan. Two times a month the physician will receive transactions from the Medical Services Plan that detail the claims paid, the amount paid and any adjustments that have been made to the physician's payment. If there are problems with the claim, the claim is returned to the physician along with the payment transactions. An explanation code is attached to every claim detailing why the claim was rejected. The physician then has the opportunity to correct any information on the claim and re-submit the claim to MSP for payment. The software provided by the Medical Services Plan will only transmit the transaction to and from the Ministry. In order to have the transactions ready for transmission the physician has two options.

Either the physician must purchase, from a private vendor, software that will create the claims, handle adjustments and record payments, or the physician may acquire the services of a computer bureau. For a fee the bureau will take handwritten or typewritten information regarding the physician's patient visits and submit this information electronically to MSP. The bureau will also track information regarding payments and adjustments and provide the physician with reports as necessary. The average cost for this service is $0.32 per claim.

In 1992 the average number of claims submitted by a family practitioner was 5,757. At the cost of $0.32 per claim, the cost of doing their billing for a year would be $1,842.24. Using a bureau service there is little saving in the salary cost for a medical office assistant as someone must still record the information required for billing whether this is on a system or on paper for submission to a bureau.

The average cost for a billing system is $1200.00 plus approximately $500.00 for maintenance, so for a single year a family physician would spend more on a bureau than on a system. It should also be considered that the bureau costs are on-going whereas the purchase of the software is a one time purchase, the only on-going cost is the maintenance fee. The major difference would be the cost of a personal computer. If a bureau is doing the billing then the physician may not require a personal computer, although this is unlikely as they would also use the computer for word processing.

For most physicians the bureau would be a more expensive alternative. However for physicians who are semi-retired or who see fewer patients, such as a psychiatrist, the bureau option may be more feasible. The average number of claims submitted by a psychiatrist in 1992 was 3012. At the cost of $0.32 a claim this would cost a psychiatrist $963.84 for a single year of bureau services. The psychiatrists' costs are half as much as a family practitioner, but still expensive when the average billing system costs $1200.

Following is some data from the Medical Services Plan that details for the past three financial years the number of physicians billing the plan, the number of services that were billed and the amount paid. The number of services billed and the amount billed are given to illustrate the importance of the billing module to a physician's office system.

Table 10 - Medical Services Plan Data for BC

Year	1991/92	1992/93	1993/94
Number of Medical Practitioners	6445	6712	6945
Number of Claims Billed by Physicians	45,845,303	44,553,059	47,564,864
Amount billed by Physicians	1,237,882,482	1,218,159,018	1,279,958,381
Number of Supplementary Specialties	2506	2702	2897
Number of claims billed by Supplementary Specialties	6,027,340	6,550,328	7,000,336
Amount Billed by Supplementary Specialties	96,156,299	100,787,980	107,715,389

Note the Supplementary Specialties includes the following: chiropractors, naturopaths, physiotherapists, oral surgeons, podiatrists, optometrists, dental surgeons, orthodontists and massage practitioners.

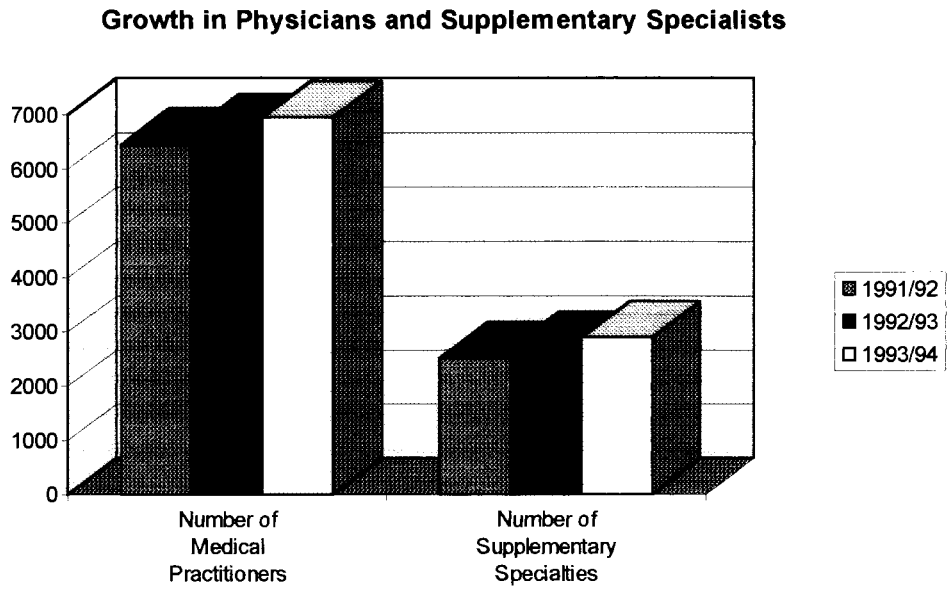


Figure 1 - Growth in Physicians and Supplementary Specialists

As can be noted from the above graph the number of physicians who are billing the Medical Services Plan has been increasing steadily for the last three years. In fact, according to the Canadian Medical Association, British Columbia is the only province in Canada where the number of practicing physicians is expected to continue to grow. The Canadian Medical Association anticipates that the number of physicians practicing in BC is expected to grow by approximately 150-200 a year for the next five years. The reasons for the increase in physicians practicing in BC are: the growing population in BC; the strong economy; and the fact that the BC government is no longer as stringent with the assignment of billing numbers.

The assignment of billing numbers effectively restricts the number of practicing physicians. Physicians cannot bill the Medical Services Plan without a billing number and the BC Ministry of Health controls the assignment of billing numbers. Recently the restrictions surrounding the assignment of billing numbers has been relaxed, particularly for physicians who are willing to practice in remote areas.

Due to the growth in the number of physicians practicing, growth in billing/office systems market segment can be anticipated. However not every new physician will require a billing system as many physicians will join existing practices that already have a system. The 200 a year growth in physicians practicing in BC can be further broken down into the expected growth in new practices and physicians taking over an existing practice.

According to the BC Medical Association for the last four years there have been approximately 35 new practices established every year. In addition the Canadian Medical Association estimates that approximately one percent of the medical population retires in any one year. For BC this would mean that for the last three years the number of practitioners retiring would be 64 in 1991/92, 67 in 1992/93 and 70 in 1993/94. The actual market growth in the billing system segment can then be expected to be 107 in 1994/95, 109 in 1995/96 and 111 in 1996/97. This is projected on one percent of the base retiring each year and 35 new practices being established every year.

The entire number of retirees is included in the estimate of this market segment for a number of reasons. First a physician who is taking over an existing practice or joining other physicians in a practice has a good opportunity to change the office administration during the transition period. A physician may want to change the office administration because they are bringing staff with them that are familiar with their procedures and systems. Or they may want to change the retiring physicians procedures because they are bringing patients to the practice. If they are bringing patients with them to the practice they will also be bringing the patient's chart and other information and this will be recorded in their own specific format.

Also when a new physicians enters a practice the other physicians may see it as opportunity for change. The physicians already in the practice may have waited until the retiree leaves to institute some changes. The new physician entering the practice, if they are entering as a partner, will also bring a cash infusion to the practice. This could be used for office upgrading, including upgrading the computer system.

It is possible that right at the moment of transition that the physicians may elect not to change their system or office procedures. However the movement of physicians to other practices does open the opportunity for change, even if it is not taken at that particular moment it may happen in the future. In addition there is a constant stream of physicians retiring every year. So even if the physicians who retire this year do not result in the new or remaining physicians seeking a new system, the physicians who previously entered a new practice as a result

of a retiree may be seeking a new system. As a result there is a constant replacement of physicians in this market segment who at any time may be looking for a new system. For this reason all retirees have been included in the estimate of the potential market.

The number of people in this segment who decide to contract the services of a service bureau is expected to be minimal, in the survey they represented 8 percent of the market. According to one of the major service bureaus they expect no growth in this market. They attribute this to the fact that many more physicians are comfortable using personal computers and are moving towards automating their practices.

Currently there are two other provinces that require the same sort of software for physician billing, Alberta and Ontario. Ontario represents the largest potential market. In 1992 Ontario had 21,480 physicians. Alberta has a physician population similar in size to BC, with 4,585 physicians in 1992.

The requirements for the billing modules in Alberta and Ontario are similar to the BC requirements but would require some customization to work correctly in those provinces. Although there is a possibility that this venture will consider those markets, in the initial startup phases only BC will be considered. However it should be noted that Ontario has the largest potential market, with almost four times the number of physicians that are resident in BC.

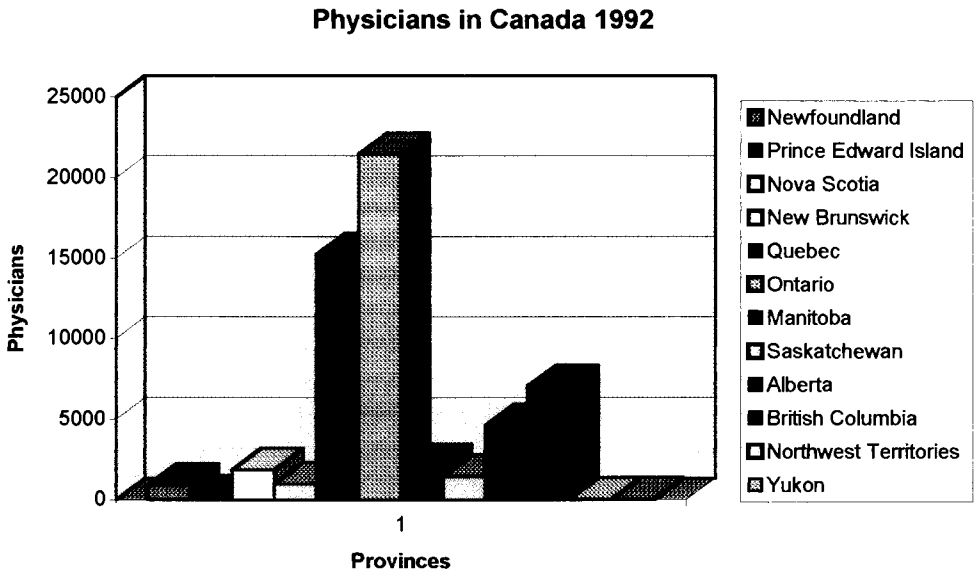


Figure 2 - Physicians in Canada 1992

Segment Two

This market segment is comprised of existing physician practices who want to replace their existing office system. The information for the analysis of this segment is taken primarily from the survey of 50 physician practices conducted by the author.

From the 50 practices surveyed only five responded that they were definitely looking for a new office system. Two responded that they were considering purchasing a new system. The reasons they were for looking for a new system were a combination of the following:

- dissatisfaction with the functionality offered by their system.
- dissatisfaction with the level of service provided by their vendor.

- the vendor was no longer in business.
- the vendor was not meeting government change requirements.

The systems used by these five respondents who were looking for a replacement system were Dialog and PMS Phoenix Systems. There was clear dissatisfaction in the market with these vendors. In addition to the seven that were considering purchasing new software there were four respondents who had recently purchased software. Two of those had previously used Dialog Systems, one had used Phoenix and one had used a Bureau. According to the results of the marketing survey Dialog has approximately 4 percent of the market and Phoenix Medical Systems has approximately 16 percent of the market. All of the Dialog clients were looking for replacement systems and 37 percent of the Phoenix clients were looking for a replacement system.

Combined these two vendors represent 20 percent of the market and 50 percent of their clients are looking for a replacement system. Using these numbers and the number of physician practices it is possible to estimate how many physicians may be looking for a replacement system. In 1993/94 there were approximately 5100 physician practices in the province of BC. If Dialog and Phoenix Medical Systems represent 20 percent of the market and 50 percent of their clients are looking to replace their system there could potentially be 510 physicians in 1994/95 who are currently looking to replace their existing system. This represents approximately 10 percent of the physician market who are looking for a replacement system. Although it is difficult to project, it is

possible that all Dialog and Phoenix clients will seek to totally replace their system in the next three years.

In addition it may be possible to assume that the number of physicians seeking to replace their Dialog and Phoenix Systems is indicative of the current replacement rate in the market. The replacement of software by clients can be due to several factors.

First clients may become dissatisfied with their vendor and search for an alternative. The dissatisfaction may be as a result of poor customer service, failure to meet government change requirements, or the software may be unsatisfactory. The software may have limited functionality, bugs that remain unresolved, or it may be difficult to maintain. Dialog and Phoenix are currently losing clients because of their poor customer service and failure to upgrade their product.

Clients may also look for another product if the product does not remain current with technology. In the 1980's software was expected to have a life expectancy of 7-8 years, however according to numerous experts in the software industry that figure is currently as little as 3-4 years. By life expectancy it meant that the software will no longer be considered useable unless it either receives a major upgrade or the system is totally re-written every 3-4 years. This is due to several conditions.

Technology is advancing rapidly. Advances in hardware and operating systems are pushing software developers to develop faster and

more sophisticated software. As outlined in the previous section the advent of the new Windows operating system, Windows '95, will have a large impact on existing software and software that is written in the future. In addition as outlined in Chapter II there are numerous forces contributing to the progression of software. First, programming languages have not remained static and the new programming languages facilitate the use of expert system logic. Second, there are new programming tools that allow for greater and better use of graphical user interfaces.

With the exception of some of the new entrants into the market the vendors in this market do not appear to be keeping pace with these changes in technology. As a result they will appear old, cumbersome and with limited functionality next to the new entrants on the market.

The replacement rate therefore also includes those physicians that will be attracted away from their existing vendors because of the lack of sophistication offered by their vendors. Technology is changing so rapidly that according to "Business Week", what is powerful today will be passé' tomorrow.[30] As noted in the previous section on customers, physicians are becoming educated computers users with sophisticated requirements. Vendors that are not able to keep pace with these requirements will lose customers.

---

[30] Coy, Peter, "Faster, Smaller, Cheaper", Business Week, (372), pp. 54.

In the marketing survey all respondents were asked how long the had their software installed, the average time was 5.9 years. The majority of the software available in the market was written and released in the late 1980's so in general the software can be estimated to be around 6-7 years old. Given that technology has changed rapidly and consumer's expectations have risen during the last seven years it may be possible to assume that many physicians will be seeking to replace their software in next few years. The findings from the marketing survey that as much as 10 percent of the market were looking for a replacement system may be indicative of a general trend in the market.

Although the life expectancy of software is as little as 3-4 years and this would allow for a replacement rate in the market of 30 percent, the marketing survey would indicate that this figure may be alittle lower. To provide for a conservative estimate of the available market the projection for this feasibility study is that 10-12 percent of this market segment may be looking to replace their system at any one time. This means that physicians who purchase software today will be looking for a replacement in 8-10 years.

Based on this assumption the market projections for 1995/96 would be 616, 620 in 1996/97 and 624 for 1997/98 for physicians looking for replacement systems (these figures include the physicians replacing their Dialog and Phoenix Medical Systems.)

In the mareket projections Segment Two has also been further discounted to allow for the fact that not all physicians will make a

purchase decision to replace their software within that year. The discount factor that was used for Segment Two was 80 percent. This indicates that 80 percent of physicians within segment two will make a purchase decision within that year. This estimate was based on the survey, where the respondents were asked if they were looking for a replacement system. Although five responded that they were looking for a new system only four said that they would make a purchase decision within the next year.

Segment Three

Segment three is comprised of physicians who are interested in automating their medical record keeping. All physicians are required by law to keep patient records. Patient records serve six different purposes according to the *Canadian Law of Patient Records.*

The primary reason for collecting and maintaining patient records is clinical. To ensure average, reasonable and prudent care the physician must keep records on the care of the patient. The failure to record information or to record it correctly can result in someone taking incorrect action or failing to take action thus resulting in patient injury.

Patient records can also play an important role in research. The research may be into the causes and courses of illness, the effects of treatment or the effects on non-therapeutic intervention. Poor records can jeopardize the validity of the research.

Patient records are also used for billing purposes in BC and other provinces. The patient diagnosis which is maintained on the patient chart must be submitted with the billing claim each time the physician bills for patient services.

Patient records may also be examined from time to time by the Canadian College of Medical Practitioners. The College may review the records for purposes of certification or discipline. Medical specialists who are applying for specialist qualifications may have to present the records as evidence of the type of work they have done. The College may also ask to review patient records for disciplinary purposes. On the basis of a complaint the College may request a physician's records for use in the investigation.

A further purpose for maintaining patient records is in the defense of a law suit. A law suit may be brought against a physician by the patient for negligence, assault, battery, breach of contract, false imprisonment or defamation. The patient records will be used in these instances as evidence.

The legal requirement for what must be maintained on the patient record is comprised of both federal and provincial legislation and regulation. At the Federal level the Narcotic Control Act requires that physicians, dentists, veterinarians, pharmacists and other persons who have access to narcotics keep records and make returns. Provincial regulations stipulate requirements relating to the actual patient record.

The requirements are regarded as a minimum standard only. The record should consist of the following:

- identification
- history of present illnesses
- history of previous illnesses
- family history, provisional diagnosis
- orders for the treatment
- progress notes
- laboratory examinations
- medical, surgical, obstetrical and radiological treatment
- operations and anesthesia
- physical examinations
- and post mortem examination if applicable[31]

Patient records as legal documents are required to be maintained after the patient is no longer being seen by the physician. According to the *Canadian Law of Patient Records* there are no clear cut rules about the patient record retention period. The authors maintain that much depends on whether the records are found in a medical or dental clinic, a hospital, a public health service or a nursing home. However the general rule for medical practices is seven years from the day of discharge. That is if the patient is no longer being seen by the physician the physician is required to maintain the record for another seven years.

---

[31] Rozovsky, Lorne., Rozovsky, Fay. *The Canadian Law of Patient Records*. Toronto: Butterworths, 1984, pp 19.

As illustrated above, medical record keeping forms an important part of the administration of a medical practice. Each practice must maintain detailed patient records for a number of years. Although the concept of computerizing the patient record is still new and relatively untried, the survey of physician offices found that there was a great deal of interest in implementing an electronic medical record.

Of the 50 physician practices that were surveyed only one had any type of charting system installed. This system was not sophisticated and was nearly 10 years old. The major functionality was to record the doctor's notes in text form and report some laboratory results.

From the survey thirty physicians offices responded that they would be interested in a charting system depending on the ease of use and the price. By extrapolating the number in the survey interested in the charting module to the entire potential market it is possible that there could be as many as 3060 physician practices interested in a charting module. This estimate is based on taking 60 percent of the 5100 physician practices as being interested in purchasing a charting system. In addition it can be anticipated that this market will continue to grow as the number of physician practices continues to grow. If 60 percent of the available market can be considered interested in a charting module this means an additional 21 practices every year are added to the market.

These projections do not assume however that all 60 percent of the physician market will purchase a charting system within the next year. The marketing survey indicated that only 20 percent of the available market will make a purchase decision within the next year. There could be several reasons for this number. First, the charting software is more expensive than other software such the billing software and the physicians may feel that this requires a more thoughtful decision making process.

Second, there is the issue of security. The product proposed by this venture will encompass some security measures however some physicians may be concerned about the possibility of people tampering with clinical information or viewing personal and private patient information. For this reason some physicians may be reluctant to purchase a charting system until they can be assured that the security risks are minimal.

Third, as outlined earlier there are few vendors offering software that provides charting. Finally the charting software will have a large impact on the physicians' daily procedures and routines. Many physicians responded in the survey that they are interested in charting but they need to make the time properly research their requirements before making a purchase decision.

However as outlined in the section on the customer, industry expectations are that physicians will rapidly convert to electronic medical records for a number of reasons. The projections given by industry

experts were that 2/5 physicians would be using some kind of charting by 1996. However to provide for a more conservative assessment, the estimate for these market projections are that 60 percent of physicians in BC will be using electronic medical records of some kind by the year 2000.

This means that although only 20 percent of the market will purchase a charting module next year, a further 20 percent of those that expressed interest will purchase the following year. This trend will continue until the year 2000 when 60 percent of physicians are expected to be using electronic medical records. It is difficult, if not impossible to predict what will happen beyond the year 2000. However, it is possible that the remaining 40 percent of physicians may then enter the market. This could be in response to government regulations, there could be greater acceptance in the market of the advantages of the electronic medical records and there is likely to be many more vendors in the market with a greater number of products to choose from.

Following is a summary of the projections for three market segments for the next three years. These estimates are based on current information only. It is possible that with government regulation or other factors these rates could change.

Table 11 - Market Projections

Segment	1995/96	1996/97	1997/98
One - New Physicians	109	111	113
Two - Physicians seeking new office software	616	620	624
Three - Physicians seeking a charting module	3081	2465	1845
Discount for physicians actually making a purchase decision			
@ 80% Segment Two - Physicians seeking new office software	513	517	521
@ 20% Segment Three - Physicians seeking a charting module	616	620	626

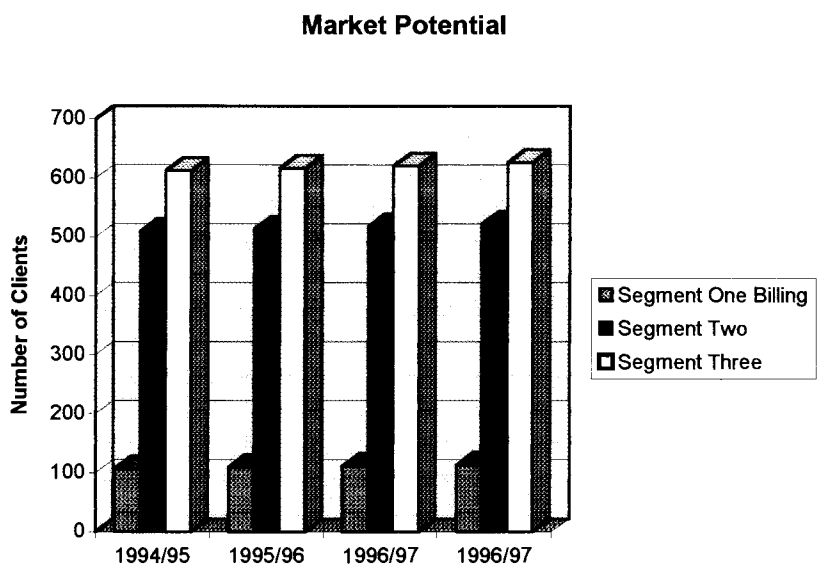


Figure 3 - Market Potential 1995/96 - 1997/98

It is clear from the preceding graph that Segment Three offers the greatest market potential. This is due primarily to the fact that this is a new market segment with untapped potential. The customer needs for

this area are just being developed and there are currently no vendors who are meeting the requirements for this segment.

Chapter IV

Internal Analysis

Introduction

Factors internal to the venture will now be considered. These are factors over which the participants in the venture have control. This section will review four components of the proposed venture. First, there will be an analysis of the skill set of the principals and other participants as they relate to the proposed venture. Second, there will be a review of the marketing plan. Third there will be a review of finance options available to the firm. Finally some financial projections will be done. This will include projected capital requirements and startup costs, and a profit and loss statement for the first two years.

Skill Set of the Participants

In this section the skill set requirements for a successful venture in technology will be examined in contrast to the skill set of the participants involved in this venture. For each participant their education and experience will be examined in light of what they can contribute to this venture. This will then be compared to what has been established as critical success factors for entrepreneurs in the information technology industry. A final summary of strengths and deficiencies will then be presented.

A recent study examined the characteristics for success for small businesses in information technology.[32] The study conducted a literature review of studies that had established success factors for small businesses in North America. The summary results from the research were then compiled into a profile of characteristics related to small business performance. This profile was then examined in light of four successful technology firms in BC and a final generic profile of small business success tabulated. The results are outlined below:

Personal Characteristics of the Entrepreneur	• Prior experience in similar type of business. • Managerial competence, particularly in cash management. In addition a cautious approach to cash flow with little debt financing and slow initial growth.
Planning Orientation	• Short-term planning, generally only for one year. • Simple planning techniques. Focus on forecasts and market strategy.
Customer Service Orientation	• Great deal of time spent with customers. • Time spent examining customer needs and how best to meet them.
Operating Characteristics	• Very limited product mix. Tendency to concentrate on only a few products. • Higher than industry average product quality and customer service.

---

[32] Cullen, June, "Prospects for Establishing a Small Business in British Columbia's Information Technology Industry", Project submitted in partial fulfillment of the requirements for the degree of Master of Business Administration; Simon Fraser University, 1993, pp 1.

Competitive Advantage	• Precise target marketing. Successful entrepreneurs focused on identifying and servicing the needs of a particular customer. • Strong relationship with suppliers to ensure they were kept up to date with the best quality and technological improvements.
Strong Marketing Orientation	• Strong marketing skills were recognized as being important. • A number of entrepreneurs have direct sales/marketing experience before initiating their own business.

The report, in summary, found that successful entrepreneurs in information technology knew their business but were also cautious and astute when it came to money management and they had a strong orientation towards customer service and sales. Each of the three principals and other participants in the proposed venture will now be examined in light of the following:

- Experience in the information technology industry;
- Knowledge about the customer and their requirements;
- Experience in marketing and sales;
- Experience in customer service;
- Experience in small business management.

Name	Dave H.
Experience in information technology	Eight years as a programmer/analyst. Two year college diploma in computer programming. Recent experience in new programming tools and technologies including C++, Visual Basic, and Object Oriented Programming.
Knowledge about customer	All eight years of programming experience in the healthcare field. Primarily worked on patient registration system and patient radiology system. Recent experience on physician orders and results reporting system. Also extensive experience in communication protocals and interface transaction standards.
Experience in Marketing & Sales	No experience in marketing and sales.
Experience in Customer Service	Extensive experience providing client support and some experience with software implementation.
Experience in Small Business Management	No experience in small business management.

Name	Brian P.
Experience in information technology	No experience in the information technology industry except as a customer.
Knowledge about customer	Extensive knowledge about customer needs as it relates to his own practice.
Experience in Marketing & Sales	No experience in marketing and sales.
Experience in Customer Service	No experience in customer service.
Experience in Small Business Management	Little experience in small business management, except for operating his own medical practice. Accounting work done by an accountant.

Name	Denis P.
Experience in information technology	No experience in information technology except as a user.
Knowledge about customer	Little knowledge about information systems for physicians.
Experience in Marketing & Sales	No experience in sales or marketing except.
Experience in Customer Service	No experience in customer service.
Experience in Small Business Management	Some experience in small business management from the perspective of an outside investor. No experience in hands-on management.

Name	Steve M.
Experience in information technology	Ten years experience in information technology as a programmer/analyst. Two year college diploma in computer programming. Recent experience in new programming tools and technologies including C++, Visual Basic, and Object Oriented Programming.
Knowledge about customer	Five of ten years of programming experience in the healthcare field. Primarily worked on patient registration system and patient radiology system. Recent experience on patient scheduling system and physician orders and results reporting system. Also extensive experience in communication protocals and interface transaction standards.
Experience in Marketing & Sales	No experience in marketing and sales.
Experience in Customer Service	Extensive experience providing client support and some experience with software implementation.
Experience in Small Business Management	No experience in small business management.

Name	Barry B.
Experience in information technology	Five years experience in information technology as a programmer/analyst. Two year college diploma in computer programming. Recent experience on drug contra-indication system.
Knowledge about customer	All of programming experience in the healthcare field. Primarily worked on pharmacy system.
Experience in Marketing & Sales	Some experience in marketing and sales as a small businessman running a DJ business in Kamloops.
Experience in Customer Service	Extensive experience providing client support and some experience with software implementation. In addition experience customer service while running own small business.
Experience in Small Business Management	Experience in small business management while running DJ business in Kamloops. Business was only a sideline however while employed in a music store.

Name	Ione P.
Experience in information technology	No experience in information technology.
Knowledge about customer	Extensive knowledge about customer requirements for registration, scheduling and billing as three years as a medical office assistant.
Experience in Marketing & Sales	No experience in marketing and sales.
Experience in Customer Service	No experience in customer service.
Experience in Small Business Management	No experience in small business management except while working in medical office and assisting with the management of the office.

Name	Alison M.
Experience in information technology	No experience in information technology.
Knowledge about customer	Extensive knowledge about the customer as Kathy is a registered nurse and has worked in a physicians' office.
Experience in Marketing & Sales	No experience in marketing and sales.
Experience in Customer Service	No experience in customer service.
Experience in Small Business Management	No experience in small business management.

The participants in the venture have many characteristics that were identified as necessary for success in a small business in information technology. However there are some areas where the skill set of the participants does not meet all of the criteria. Outlined below is a summary of the participants skills in contrast to those characteristics that were identified as important for success in a small business.

Personal Characteristics of the Entrepreneur	• Although they do not have experience establishing their own business in information technology, Dave, Steve and Barry have extensive experience in information technology industry and specifically in the healthcare field. • Aside from Denis and Barry, none of the participants have any experience in the management of a small business. Experience and expertise in cash management is definitely an attribute that is lacking.
Planning Orientation	• Dave, Steve and Barry all have experience in project management and planning. However aside from Denis there is no one with experience in forecasting sales and small business planning.
Customer Service Orientation	• A number of the participants; Dave, Barry, Steve, Brian, Ione, and Kathy have knowledge about customer needs and are close to the medical field. However there is no one in the group that has specific experience in customer service. As developers Dave, Steve and Barry had little exposure to responding to customer requests and complaints.
Operating Characteristics	• The participants in the venture intend to provide a superior product with superior service however there is no one in the group that has extensive experience in quality assurance testing or documentation. Software products require extensive testing before they may be introduced onto the market place. In addition, documentation, either on-line or

	hardcopy, can be very important to client satisfaction.
Competitive Advantage	• The competitive advantage of this venture has been based primarily on providing the physician with new and enhanced functionality by using new programming tools and technologies and being the first on the market with this product.
Strong Marketing Orientation	• There is no one in the current list of participants that has a strong marketing or sales experience or expertise.

The Marketing Plan

The marketing plan for this venture is comprised of three elements: advertising, promotion and sales. The participants in the venture have recognized that the success of their venture will be dependent not only on a strong product offering but on a solid marketing plan. The proposed marketing plan has been designed to differentiate between the three segments. This is in part due to the fact that all of the modules will not be available at the same time and partially due to the different approach required.

The focus of the marketing effort will be to communicate the following features of the new venture:

- technologically advanced product that utilizes a familiar Windows frontend;
- designed for the BC market;

- designed for the future with tools that allow voice and remote input, access to medical databases and integration with other systems.

The marketing plan covers the first two years of operation, however the plan will be evaluated constantly for its effectiveness and may be changed as necessary.

Year One

In the first year of operation the venture will be concentrating on establishing a name in the market place, securing good reference sites in all the major centers and making enough sales of the product to keep the operating deficit to less than $50,000. In the first year there will be no designated sales person because of financial constraints. Dave and Steve, as the only full-time employees will have responsibility for most of the sales effort with some input from Brian. Brian's role will be primarily as a spokesperson and a contact in the medical community.

Brian's medical practice will be the primary beta site. It is Brian and his office staff's responsibility to test the product, note any problems and make suggestions on changes to the functionality. Once he is satisfied with the product it will be his job to invite his colleagues to see the product and encourage others to act as secondary beta sites. Any physician who offers to act as a beta site will be charged 50 percent of the regular price and 50 percent of the regular maintenance fees for the first year. The objective is to have a beta site in the following centers:

Vancouver, Victoria, Nanaimo, Kamloops, Kelowna, Nelson, Prince George, Fort St. John and Prince Rupert.

Beta sites are important for two reasons. They test the product under different situations in different practices, and they provide a local reference. To date the other vendors in the market have relied almost entirely on word of mouth advertising. A new physician in town or setting up a practice will ask the other local physicians what software they use and whether or not they are satisfied. If they are satisfied then usually that physician will use the same software as his/her colleagues.

The beta sites will be sought through two means. First, friends and colleagues of Brian's will be targeted and asked if they would like to view the software and possibly try it in their own practices. The second target will be practices who are known to have the software that dominates that particular geographic region. This will be done as a follow-up to the survey done by the author.

For example, Osler is known to dominate the market in the Victoria region. A physician who was identified in the survey as using the Osler system will be contacted. They will be told about the product, offered a demonstration diskette and given the names of several references. If the physician is willing to trial the product he/she will be given the product for three months free of charge. If they are satisfied with the product then they will be given the option to purchase the product for half the regular selling price and charged half the regular maintenance for the first year. If that physician proves satisfied then the

participants in this venture feel that they may have strong opportunity to sell the system to other physicians in that location.

The demonstration diskette is the other focus of the advertising effort. A diskette that contains an interactive demonstration of the product will be prepared by the development group. The diskette will be prepared in such a way that those who want to view the product may simply insert the diskette into their floppy drive and through the file maintenance option select run. The diskette will then take the person through the system functions and features much like a tutorial supplied with most of the Microsoft products. The purpose of the diskette is to visually demonstrate to the user the features of the product and the ease of use.

The diskette will be used in two ways. First the diskette will be available for anyone who makes inquiries about the product. This means that someone who makes a telephone inquiry will be sent the diskette so that they may be able to view the system themselves at their leisure. The other vendors in market must currently make appointments with the physicians and then travel to their office if they wish to demonstrate their product. This not only limits the number and places where the product may be demonstrated but also adds considerably to the marketing and sales costs.

The second objective of the diskette is to use it in an ad in the BC Medical Association Journal. The idea is to place a full page colour ad in the journal with a copy of the diskette. The placement of the ad will be

in conjunction with the launch of the product when all three modules are functional and have been thoroughly tested by the beta sites. It is anticipated that the formal product launch will take place in July 1996.

The BC Medical Association Journal is a monthly journal that is sent to all registered medical practitioners in the province, circulation is around 8000. The cost of the ad plus the insert is expected to be $2700 for the ad and $4000 for the diskette insert. The cost of developing the demonstration diskette is expected to be around 50 hours, or $2000. Although this is expensive, the idea is to make a large impact on the market as soon as the product is ready. A review of two years of BCMA Journals showed that no other vendor in the medical software market has advertised in this manner. Osler Systems is the only vendor that advertises regularly in the journal and its ads are usually small, quarter page and black and white. The only companies that take out full page ads in the journal are the drug companies whose ads are often more than one page and lavishly done.

The BCMA Journal was chosen as the primary advertising venue because it targets the market directly. Every physician in BC belongs to the BCMA and consequently every physician receives the journal. In addition physicians receive a great deal of information and literature through the mail and it was felt the journal would offer better exposure than any type of direct advertising through a mailing.

In addition to the diskette a promotional brochure will be prepared. The brochure will be sent out with the diskette in response to phone

inquiries. The brochure will contain information about the product features as well as the price, type of maintenance offered and how to contact the office using the 1-800 number for more information.

Besides offering the product at a discount to beta sites and advertising through the BCMA Journal there will be one other aspect to the promotion of the product. The product will be demonstrated at trade shows and conferences. There is an annual conference for Health Information specialists held every year in Vancouver. The exhibitors fee is large, $5000, however the conference is well attended by information systems personnel, nursing and medical personnel who have an interest in information systems and consultants. Consultants play a large role assisting hospitals and large medical practices in choosing their software. It is important to build awareness with the consultants in this area as although they do not make the purchase decision they often direct which vendors are considered.

Year Two

In year two another employee will be hired to handle client relations including sales and support calls. The salesperson will continue to target specific physician practices. They will focus on practices where the vendor used by the physician is a vendor that this venture has successfully replaced in other practices. For example if Dialog has been successfully replaced by this venture, then physicians who used Dialog will be targeted.

The salesperson will be remunerated by a combination of a base salary and a 10 percent commission on all sales. The commission will be on the sale of the software only, not on the maintenance fee. The participants would like to recruit someone who is familiar with the industry and has extensive sales experience. The salesperson will be expected to operate independently. Performance will be reviewed based on the salesperson's ability to meet sales targets and deal effectively with the clients.

There will be no other major change to the marketing effort in the second year and third year. If the advertisements and promotions at the trade shows generated enough sales to justify their costs they will also be continued in Year Two and Year Three of the marketing plan. All follow-up to these marketing efforts will be done by the salesperson. It will be the salesperson's responsibility to determine the effectiveness of all marketing efforts.

Every sale will be researched to determine how the customer learned about the product and what prompted the purchase decision. If the advertising or trade shows are not found to have generated enough sales to cover their costs then whether they are continued will be examined. It is necessary however, to consider the importance of building brand recognition and awareness. According to marketing experts in the technology industry it generally will take two to three ads before any interest is generated. As a result of the time lag between placing the ad and generating some interest, the advertising will be examined on a six month basis as opposed to a case by case basis. It

will be the responsibility of the sales person to demonstrate whether the ads and the trade shows are an effective marketing tool.

Sales Projections

The sales projections have been based on the market projections from the earlier section and on estimates of potential sales. The estimates of potential sales have considered the following:

- The product availability. The entire system with all modules complete will not be available until July 1996. The Sales forecast has been discounted to allow for the fact that Phase One will not be ready for distribution until April 1996 and Phase Two will not be ready for distribution until July 1996.
- The advertising and promotion efforts in the first year of the operation and the addition of the salesperson in the second year of operation.
- The degree of product acceptance. The participants in this venture feel that the market is ready for a technologically advanced product.
- The product offering by the other vendors including the potential entrants into the market with similar products for comparable prices.
- The personal attributes of the participants involved in the venture including their contacts in the industry.

In addition to the previous points the Sales Forecast also looked at the Market Forecasts from Chapter II and the degree of market penetration of the competition in the billing/office system segment. The industry is dominated by Osler with 40 percent of the market, however

the rest of the market is split evenly amongst the competitors. The smallest market share is held by Co-Star with 2 percent of the market, the second largest market share is held by Phoenix with 16 percent of the market and the rest are split evenly around 8 percent. Most of the competition have been in the market for about 5 to 7 years, with the exception of Clinicare and Stratevarius which have been in the market for only 2 years. However even though these vendors were late comers into the market they have 8 percent and 4 percent of the market respectively.

The Sales Forecasts have been based on the market penetration of newcomers into the market and the available market defined in Chapter III. In Chapter II the entire market size was defined and then the market was further refined in terms of the market potential. Not all physician practices were considered potential customers in any one year. For the Billing and Scheduling Modules the market potential was defined as new physicians seeking software for the first time and physicians seeking to replace existing software. For the Charting Module, 60 percent of physicians were considered in the market potential but then the market was reduced drastically to allow for the fact that not all physicians will make a purchase decision within one year.

The sales estimates are extremely conservative in nature because they only provide for the capture of a certain amount of the *available market*, not the entire market. This means that the venture is only competing with existing and new vendors for the available market and they are not taking market share from existing vendors in every

situation. The venture will be only trying to take market share from existing vendors in Segment Two, the segment including physicians who are seeking new or replacement software.

To account for different sales scenarios the Sales Forecast has been split into Worst, Likely and Best Case Scenarios. In the Likely Scenario it is projected that this venture will be able to capture 4 percent of the available market in the first year, and a further 8 percent of the available market in the second year and third year. In the Worst Case Scenario the figures have been halved and in the Best Case Scenario the figures have been doubled to 8 percent in the first year and 16 percent in the second year and third year.

For Segment Three it is more difficult to predict the rate of market penetration due to the fact that this is a new market. However it is likely that it will follow a similar pattern to Segments One and Two. Although, there is currently little competition in this segment, by July 1996 when the Charting Module is ready to launch there may be more entrants into this market. On this basis and to provide a conservative estimate the same percent of market penetration has been used for Segment Three as for Segments One and Two. The Likely Case scenario allows for 4 percent of the available market in Year One and 8 percent of the available market in Year Two and Three.

Following are the sales projections for the first three years of operation. For the purposes of this study the fiscal year begins

September 1, 1995. The projections have been broken down in segments and they have been split in Worst, Likely and Best Case scenarios.

Table 12 - Sales Forecast Year One

Sales Forecast Year One		Worst	Likely	Best
Segment One		1	2	4
Segment Two		4	8	15
Segment Three		2	4	8
Promotional Sales @ 50%				
Billing Module		2	4	6
Scheduling Module		4	6	8
Charting Module		2	6	10
Contract Hours		100	350	700

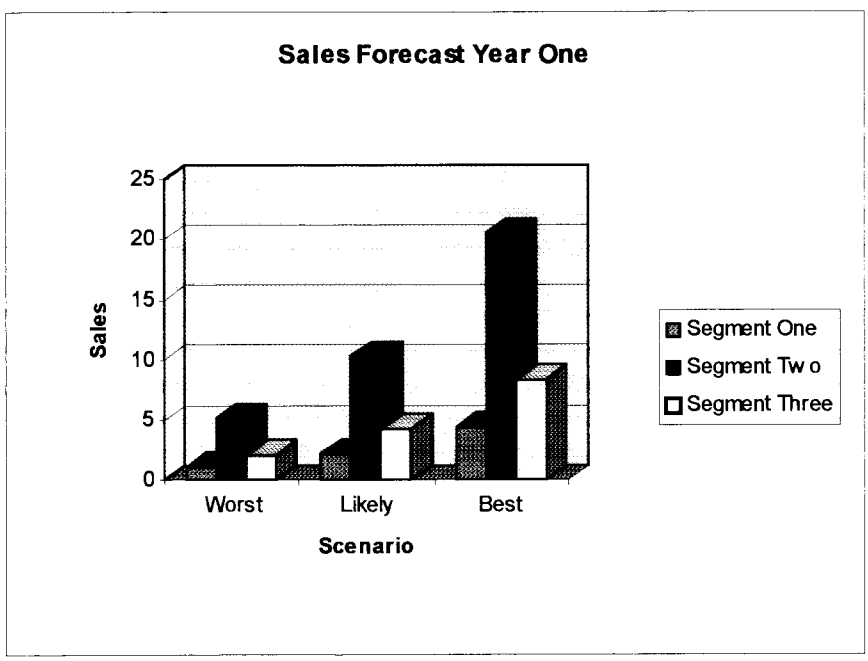


Figure 4 - Sales Forecast Year One

Table 13 - Sales Forecast Year Two

Sales Forecast Year Two		Worst	Likely	Best
Segment One		4	9	18
Segment Two		21	41	83
Segment Three		25	50	99
Promotional Sales @ 50%				
Billing Module		2	4	6
Scheduling Module		4	6	8
Charting Module		6	8	10
Contract Hours		0	0	0

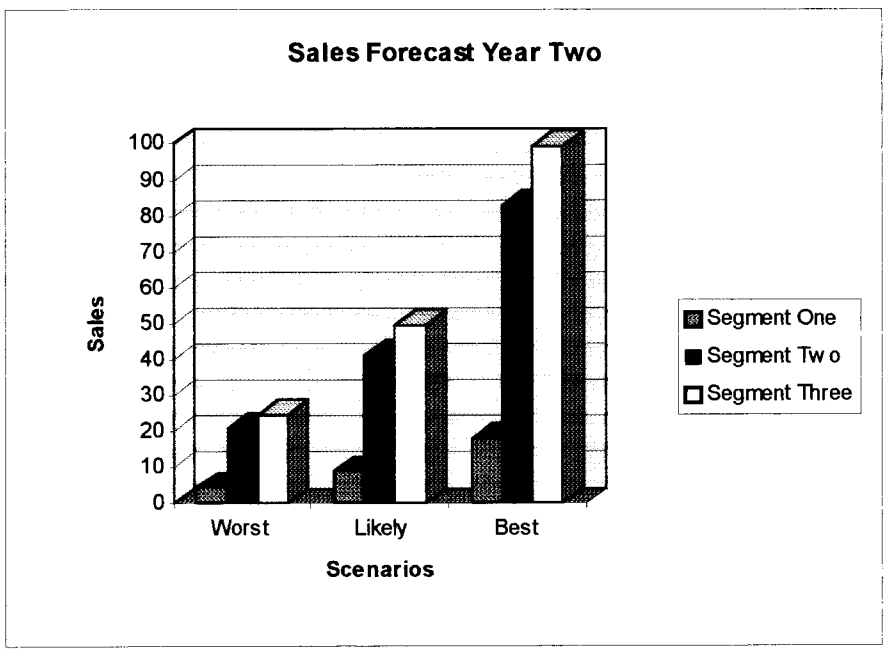


Figure 5 - Sales Forecast Year Two

Table 14 - Sales Forecast Year Three

Sales Forecast Year Three		Worst	Likely	Best
Segment One		5	9	18
Segment Two		21	42	83
Segment Three		25	50	100
Promotional Sales @ 50%				
Billing Module		1	2	3
Scheduling Module		2	3	4
Charting Module		3	4	5
Contract Hours		0	0	0

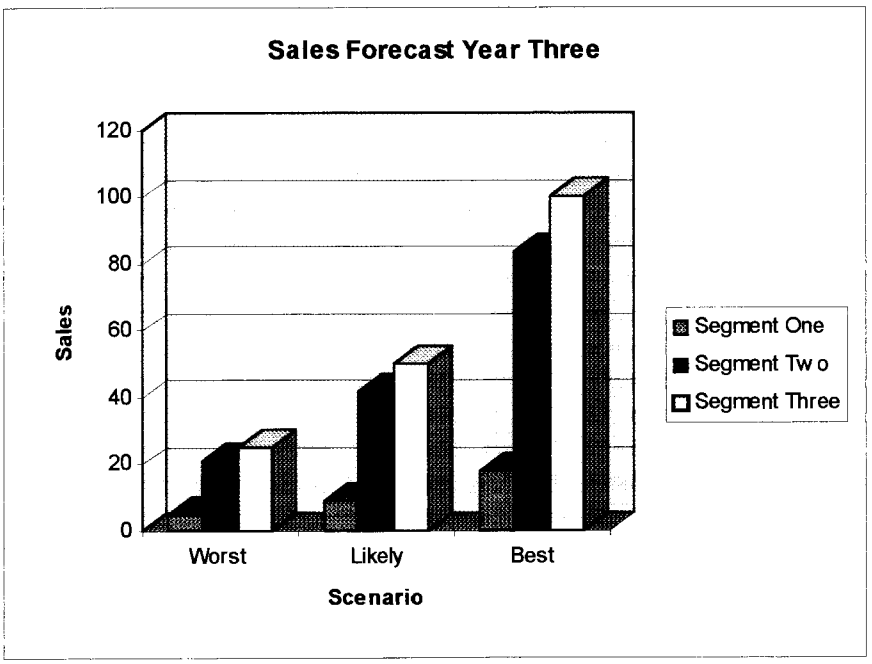


Figure 6- Sales Forecast Year Three

As can be noted from the preceding tables and graphs the focus of the sales potential shifts from Segment Two to Segment Three from Year One to Year Two. This is due to two factors. First the Charting Module is not available to be sold until almost the end of the first year. In

addition the greatest market potential is in Segment Three due to the lack of competition and the growing demand for this type of technology.

Segment Three shows the greatest sales potential, while Segment One shows the least potential. Segment Three however is the hardest to forecast due to the lack of an existing market for this product. Although the physicians surveyed expressed a great deal of interest in a product of this nature it is difficult to know the degree of product acceptance and interest. Segment One and Two are easier to forecast as software similar to the type proposed by this venture is required by the government and physicians are both knowledgeable about their needs and experienced users of the technology.

Financial Projections

The financial projections are based on the sales projections from the preceding section, approximate salary and other operational costs and the start-up costs. Financial projections for all three scenarios of worst, likely and best sales will be shown. Financing costs will not be included. The participants do not want to incur any debt until the venture is established and showing a 10 percent return on equity.

Startup costs

The startup costs include costs associated with establishing an office and purchasing necessary equipment and software tools. The costs are a one-time expense and will be written-off in the first year. There are no major equipment costs as both Dave H. and Steve M. have already

purchased the necessary equipment and any additional equipment will be leased in the short-term.

Startup costs:	
Office setup and supplies	5,000
Software tools	2,000
Computer equipment	1,500
	$8,500

Revenue Projections

Revenue projections are based on the sales projections from the preceding section. Except where it has been noted all sales are expected to be at full price. For the purposes of this exercise the financial year is assumed to begin September 1, 1995. No expenses are expected to be charged against the venture and no revenue generated prior to this time.

When reviewing the Revenue Forecasts the following should be noted:

- The Maintenance Revenue is based on the maintenance amount quoted in the price table. For Segments One and Two the maintenance revenue in Year One has also been discounted by 40 percent to allow for the fact that the Product will not be ready until April 1996, almost half way through the financial year. For Segment Three the maintenance revenue has been discounted by 83 percent to allow for the fact that the Product will not be ready until July 1996.
- In Year Two the Maintenance Revenue includes revenue from Year One and Year Two. It is assumed that all clients that bought the system in Year One will continue to pay maintenance in Year Two. In

addition the maintenance revenue in Year Two has been discounted to allow for the fact that not all purchases will be made at the beginning of the year, therefore some of the maintenance will be prorated.

- For Segments One and Two the sales revenue and maintenance revenue include some sales from the Patient Scheduling Module as well as the Billing Module. Based on the Marketing Survey the Scheduling Module is expected to be sold with the Billing Module in 48 percent of all sales. As a result the revenue forecasts include sales of the Scheduling Module in 48 percent of all sales of the Billing Module. No individual sales of the Scheduling Module have been counted. This is due to the fact that there does not appear to be a market for stand-alone Scheduling Systems. To date all sales of scheduling modules by other vendors has been in conjunction with sales of a Billing System.
- For Segment Three the Revenue Forecast is based on the sales from the Charting Module only. Although the Billing Module and Scheduling Module can be sold with the Charting Module the Sales Forecast for this Segment was for the Charting Module only.

Table 15 - Revenue Forecast Years One through Three

Revenue Forecast Year One	**Worst**	**Likely**	**Best**
Segment One			
Sales	1585	3170	6339
Maintenance	366	732	1465
Segment Two			
Sales	7392	14785	29569
Maintenance	1724	3447	6895
Segment Three			
Sales	8116	16232	32463
Maintenance	503	1005	2011
Promotional Sales @ 50%			
Billing Module	1825	3650	5475
Scheduling Module	3950	5925	7900
Charting Module	4355	13065	21775
Contract Work	6500	22750	45500
Total Revenue	**$36,316**	**$84,761**	**$159,392**

Revenue Forecast Year Two	**Worst**	**Likely**	**Best**
Segment One			
Sales	6398	12796	25592
Maintenance	2864	5940	11881
Segment Two			
Sales	29800	59600	119200
Maintenance	13870	27740	55480
Segment Three			
Sales	96100	192200	384400
Maintenance	31042	62083	124166
Promotional Sales @ 50%			
Billing Module	1675	3350	5025
Scheduling Module	3625	5438	7900
Charting Module	16125	20000	25000
Contract Work	0	0	0
Total Revenue	**$201,498**	**$389,147**	**$758,644**

Revenue Forecast Year Three	**Worst**	**Likely**	**Best**
Segment One			
Sales	6513	13027	26053
Maintenance	5994	11988	23977
Segment Two			
Sales	30030	60061	120122
Maintenance	27848	55695	111391
Segment Three			
Sales	97030	194060	388120
Maintenance	68512	137023	274046
Promotional Sales @ 50%			
Billing Module	838	1675	2513
Scheduling Module	1813	2719	3625
Charting Module	7500	10000	12500
Contract Work	0	0	0
Total Revenue	**$246,077**	**$486,248**	**$962,347**

Expense Projections

The expense projections have also been broken down into Worst, Likely and Best case scenarios to account for the variable costs associated with packaging and maintaining the software. In addition, in Year Two there will be a variable salary expense associated with commission of the salesperson.

When reviewing the Expense Projections the following should be noted:

- The office expense for the first two to three years is expected to be minimal as the participants in the venture envisage that they will primarily be working out of their homes. As the business grows this may have to be re-visited.

The Telephone expense includes the cost of a 1-800 number and another business line. To approximate the cost of the long-distance expense the phone was estimated to be in use 2 hours a day in Year One and 3 hours a day in Year Two and Year Three. That is, there will be calls received and calls outgoing within BC for 2 hours a day 264 days a year. Although this may sound high it is important to note that the majority of sales will be done using the phone.

- The Advertising expense includes the cost of one BCMA ad in Year One and two ads in Year Two and Year Three. There is only one trade show a year so that figure is the same for all years.
- The cost of providing maintenance has been estimated to be 50 percent of the price to provide the service. This approximation is based on the industry standard of a 50 percent markup for maintenance. The other vendors' maintenance fees are approximately the same as offered by this venture so assuming that they are following industry standards their costs must be approximately half of the price they charge to provide the service. Maintenance costs are intended to cover the cost of telephone support, the re-release of software kits due to problems, printed material, and any additional salary expense due to overtime or on-call allowances.

Table 16 - Expense Projections Years One through Three

Expense Projections Year One	**Worst**	**Likely**	**Best**
One time Start up expense	8500	8500	8500
Salary Expense			
Developer One 50,000 @ 83%	41500	41500	41500
Developer Two 50,000 @ 66%	33500	33500	33500
Office supplies	4000	4000	4000
Telephone	10000	10000	10000
Lease Equipment	1200	1200	1200
Marketing Expense			
Advertising	7000	7000	7000
Promotion	6000	6000	6000
Packaging @ $50 per module shipped			
Billing	155	309	518
Scheduling	457	813	1426
Charting	205	509	919
Maintenance Cost			
Billing	327	654	1308
Scheduling	1667	3335	6669
Charting	1571	3142	6283
Total Expenses	**$116,081**	**$120,462**	**$128,823**

Expense Projections Year Two	**Worst**	**Likely**	**Best**
Salary Expense			
Sales person including commission			
Developer One 52,500	52500	52500	52500
Developer Two 52,500	52500	52500	52500
Office supplies	6000	6000	6000
Lease Equipment	2400	2400	2400
Telephone	15000	15000	15000
Marketing Expense			
Advertising	14000	14000	14000
Promotion	11600	11600	11600
Packaging @ $50 per module shipped			
Billing	322	644	1188
Scheduling	1234	2368	4536
Charting	1540	2880	5460
Maintenance Cost			
Billing	1659	3318	6636
Scheduling	9679	19358	38715
Charting	20171	40342	80683
Total Expenses	**$231,834**	**$279,369**	**$374,137**

Expense Projection Years Three	**Worst**	**Likely**	**Best**
Salary Expense			
Sales person including commission			
Developer One 52,500	55125	55125	55125
Developer Two 52,500	55125	55125	55125
Office supplies	9000	9000	9000
Lease Equipment	3600	3600	3600
Telephone	15000	15000	15000
Marketing Expense			
Advertising	21000	21000	21000
Promotion	11600	11600	11600
Packaging @ $50 per module shipped			
Billing	276	552	1054
Scheduling	1142	2234	4368
Charting	1402	2704	5258
Maintenance Cost			
Billing	3015	6030	12060
Scheduling	14516	30323	60645
Charting	38898	77902	153114
Total Expenses	**$273,057**	**$346,909**	**$490,378**

Table 17 - Profit and Loss Summaries

Summary Profit and Loss Year One	**Worst**	**Likely**	**Best**
Total Revenue	$36,316	$84,761	$159,392
Total Expenses	$116,081	$120,462	$128,823
Net Profit (Loss) before Taxes	**($79,765)**	**($35,700)**	**$30,569**
Summary Profit and Loss Year Two	**Worst**	**Likely**	**Best**
Total Revenue	$201,498	$389,147	$758,644
Total Expenses	$231,834	$279,369	$374,137
Net Profit (Loss) before Taxes	**($30,336)**	**$109,778**	**$384,507**
Summary Profit and Loss Year Three	**Worst**	**Likely**	**Best**
Total Revenue	$246,077	$486,248	$962,347
Total Expenses	$273,057	$346,909	$490,378
Net Profit (Loss) before Taxes	**($26,980)**	**$139,339**	**$471,968**

The financial projections would indicate that except in the first year and in the second year under the Worst case scenario that this venture could be profitable. Based on the projections it would appear that equity investment can be sought with confidence. However it is important to note that although the figures appear to be extremely favorable there is a high degree of risk associated with this venture. The projections are entirely based on the assumption that this venture will be the first to the market with a product of this nature and that the product will be ready by the scheduled dates. If either of these two variables are not true then the feasibility of the venture will be adversely effected.

Financing

All of the proceeding financial projections have been done without considering the capital requirements. The principals involved in the venture consider that they will be able to raise $50,000 of equity capital. This money will be acquired primarily from three sources: personal savings, personal lines of credit, and private investors. In addition, to minimize the personal financial exposure the principals will be seeking government grants and subsidies.

Appendixes B, C and D contain cash flow projections. As can be noted from the projections the $50,000 will be used to fund the start-up phase of the venture. In the beginning of the second quarter in Year Two the venture shows a positive cash flow and from that point on the venture will be self financing or should be able to seek bank financing with confidence.

The cash flow projections clearly indicate that the need for financing is minimal. This is due to the fact that the startup costs are small and that the venture will begin to recognize revenues within six months of inception. As noted in the earlier section these estimates are based on the fact that the product will be available by the scheduled dates and that sales will be made almost immediately.

The cash flow projections have been done based on the Revenue projections for the "Likely" scenario. No allowance has been made for

uncollectable accounts and receipts are expected to be collected within sixty days of invoicing.

Given that the assumptions in Cash Flow projections are correct, $50,000 start-up capital would seem to be reasonable. With the $50,000 there will be a small cash short-fall toward the end of the first year. However it may be possible to overcome this short-fall by delaying payment of some accounts or collecting some of the Accounts Receivable earlier. In addition if the principals are able to acquire some government assistance this could ease the cash situation and may eliminate the need to subsidize revenues in the first year with contract work.

Followings are Pro Forma Balance Sheets for the first three years of operation. These are rather simple in nature due to the fact that there are few assets associated with this venture and the major liability will be to the shareholders. The Balance Sheets indicate the loss in the first year followed by a return of 148 percent on the original investment in the second year.

Table 18 - Pro Forma Balance Sheets Years One through Three

Pro Forma Balance Sheet August 31 1996

Cash	1254
Accounts Receivable	13045
Total Current Assets	$14,299
Owner's Equity and Liabilities	
Short-term Liabilities	0
Owner's Equity	14299
Total Liabilities and Owner's Equity	$14,299

Pro Forma Balance Sheet August 31 1997

Cash	91590
Accounts Receivable	32417
Total Current Assets	$124,007
Liabilities and Owner's Equity	
Short-term Liabilities	0
Owner's Equity	14299
Retained Earnings	109778
Total Liabilities and Owner's Equity	$124,007

Pro Forma Balance Sheet August 31 1998

Cash	130048
Accounts Receivable	40520
Total Current Assets	$170,568
Liabilities and Owner's Equity	
Short-term Liabilities	0
Owner's Equity	14299
Retained Earnings	156,269
Total Liabilities and Owner's Equity	$170,568

Projections beyond the third year have not been done due to the extremely fast pace of this industry. Three years from now any number of variables could have changed. There could several other vendors in the market, the government could have issued legislation regarding the requirements to computerize physician office practices as a cost saving method or there could be severe cut-backs in healthcare which would substantially hinder the market growth for new technologies in physician offices.

Fortunately for the venture there is a very short payback period. By Year Two the venture has completely recouped the original investment of $50,000. The pre-tax profit for Year Two is $109,778. Allowing for the loss in the previous year, the investors are able to completely recoup their investment by the end of the second year. This is a positive sign for the investors given the volatile nature of the software industry. Even if the venture is not as successful beyond Year Three at least the investors

may be assured that they will not only regain their original investment but will realize a sizeable return in the short-term.

However even if number of sales diminishes over time sales revenue is only one part of the revenue stream for the venture. The other important source is maintenance revenue. Maintenance revenue is extremely important in terms of the sustainability of the venture.

After the Second Year the sales projections using the Likely Scenario indicate that there will be 37 Billing clients, 33 Billing plus Scheduling clients and 68 Charting Module clients. This amounts to a total of 138 clients and $148,950 in maintenance fees annually. When this amount is compared to the total revenue for Year Two under the Likely Scenario it represents 48 percent of total revenue.

By Year Three there will 68 Billing client, 64, Billing plus Scheduling clients and 114 Charting Module clients. This is a total of 242 clients and equals $259,800 in maintenance fees annually. For Year Three this equates to 53 percent of total revenue.

With the growing number of clients paying annual maintenance it is possible that the venture could sustain itself with only incremental sales. Following is a break-even analysis using Year Three expense figures as a guide. The amount required to break-even has been reduced by the $259,800 maintenance revenue expected from existing clients.

Table 19 - Break-even Analysis

Direct Costs	**Likely Scenario**
Salary Expense	
Sales person including commission	56715
Developer One 52,500	55125
Developer Two 52,500	55125
Office supplies	9000
Lease Equipment	3600
Telephone	15000
Marketing Expense	
Advertising	21000
Promotion	11600
Maintenance Cost	
Billing	6030
Scheduling	30323
Charting	77902
Total Direct Costs	**$341,419**
Selling Price entire product	$4,400
Variable Costs	
Sales commission	440
Packaging	50
Maintenance	800
Total Variable Costs	**1290**
Variable Sales Profit	3110
Variable Sales Profit %	71%
Fixed Costs	$341,419
Sales to Break-even	**$115,474**
Unit sales to Break-even	**26**

Although 26 unit sales would appear to still be quite a large number this is actually only 26 percent of the sales forecast for Year Three. In addition it should be noted as more clients are added to the client base the requirement for new sales to sustain the venture is further diminished. However before any additional capital investments

are made beyond the initial $50,000 the venture should be re-assessed in terms of future market potential and profitability.

Although the expectation is that the venture would continue to capture market share it is important to note that given the volatility of the industry that it would be possible for the venture to sustain itself with only minimal sales once it has a achieved a reasonable client base. In addition as this client base grows the number of sales required to break-even becomes smaller. At the point where maintenance revenue covers the cost of the operation is the point that most software companies aspire to reach. Once this point is attained then they are able to realize large returns on their investment and also to use excess profits for more research and development, thus further securing their place in the market.

Chapter V

Strategic Analysis

Introduction

This chapter will examine the key risks associated with the proposed venture and recommend alternative strategies to overcome perceived risks.

Key Risks

The strategic focus of the venture is to be the first on the market with a product that employs much of the latest technology. Other features of the strategy are a level of investment to grow the company, a marketing strategy for rapid market penetration, and the unique skills and attributes of the participants involved in the venture.

The first part of the strategy is to be the first to develop a product unique from the competition in terms of features. There are several risks associated with this strategy. The first and most evident risk is that the venture will not be the first to market with a product of this nature. The proposed product will not be available with all modules until at least July 1996. This is almost a year away. In that time an existing vendor could launch a product with similar functionality or a new competitor could launch a product with the same features as those proposed by this venture.

A vendor that is already in the market would have the advantage of an established client base and an established name. They would be able to use their existing clients to pilot the new software. In addition if the software proved to be successful they would be able to use those sites to market to new sites.

Any new vendor would face the same challenges of attracting clients and establishing themselves as reputable vendor. In this industry there have been several vendors that have left the market abruptly. Either the business was sold to someone else or the business was shut down. This left clients with problems regarding the support and maintenance of their product or the requirement to move to a new vendor. Conversion to a new vendor is both timely and expensive as new hardware may required as well as new software. As a result many physicians are wary of small, new startup companies that may not be successful.

The other risk associated with the timeline of this venture is that the development estimates and proposed release dates are currently only estimates. New software is notoriously always a bigger and more complicated job than expected. The new operating system from Microsoft has missed at least two deadlines and it has still not been formally released a year after the promised date. It is possible that this product could take much longer than projected to complete. The opportunity to beat the competition in terms of being first would be jeopardized even further. There is also the issue of credibility. If the product has been

promised to prospective clients it could damage the company's reputation if they are not able to deliver by the promised dates..

The third risk associated with being the first on the market with a new product is product acceptance. The product will present differently than the competition because it will be Microsoft Windows based and it will include functionality that is not currently available on the market. It is difficult to predict how well the product will be accepted. Windows based products are now standard for many new systems and the public's familiarity with Microsoft products is growing. In addition physicians, as mentioned in Chapter III are becoming more computer literate. As physicians are exposed to more and more sophisticated software their expectations regarding system performance and functionality will grow. It is these two factors which the principals in this venture are hoping will overcome any resistance to the product.

It is particularly critical that physicians and their office staff respond favorably to the product because the participants in the venture do not intend to provide training with the product. There are two rationales to this approach.

First, Windows based products are supposed to be intuitive in nature. People using the product who are familiar with the business area should be able to figure out for themselves how the product is meant to work and how to accomplish the necessary tasks using the application. The product proposed by this venture will be Windows based and the participants in the venture feel that the users in their

target market should be able to use the application without any training. Many people are now quite familiar with Windows based applications such as Word. It is also assumed that the users in the target market are also familiar with their own business rules and requirements.

The second rationale for not providing training is that the profit margins are reduced by allowing for the expense of training. There is potentially a large cost associated with providing training as the prospective clients will be located all over the province of British Columbia. To provide training to anyone outside of the Lower Mainland would require either mileage expense or airfare expense, as well as incidentals such as meals, airport tax and tips.

In addition the sales effort is not focused geographically so sales could come in one week from Fort Nelson and Vancouver Island and the next week from the Interior and the Lower Mainland. Physicians who purchase the system will also have varying needs about implementation and training. Some may want to get started right away and others may purchase the system and then not install it for several months. These two factors eliminate some of the possibilities of combining several sites into one training trip. If the sales trips could be rationalized and several sites combined into one trip then the cost of providing training may not be so prohibitive. But if there is a requirement to travel all over the province to provide training for only a few hours at a time then the cost could be substantial.

However by not providing training this venture is possibly diminishing their chances of being successful. One of the most successful vendors in the market, Osler, is purportedly successful because of their record for good customer service. Different participants associated with the venture who have reviewed Osler's software also report that the software itself is not that remarkable and that there are other products on the market that in their opinion offer more functionality.

Osler's customer service includes 2.5 hours of training with every new sale. This is unique in the market, no other vendor offers training as part of the sales package. Other vendors will offer training as required and it is generally on a time and materials basis. In addition according to the marketing survey conducted by the author, Osler's after sales support is very good. They have a good track record for providing regular updates to their software and according to most of those surveyed their helpline for software support is also very good.

In addition to the need for training on the software physicians may require assistance with the hardware. The software proposed by this venture requires a new level of sophistication not yet found in many physician offices. Instead of a single PC for billing and word-processing purposes the setup for a physician using all of the modules will require several networked PC's, handheld devices linked to the server through radio links and multiple printers. This setup may be more than a lot of physicians and the clerical staff can handle. In addition many physicians may have to purchase new hardware for the system and

unless they are properly instructed in what to buy they may aquifer the wrong configurations. For example they may purchase under powered PC's and inappropriate support software.

The fact that Osler has been able to capture a large market share based on their customer service is not unique in the software industry. As outlined in Chapter II customer service was the number one critical factor that contributed to the success of software companies, product quality was the second critical factor. The competitiveness of the software industry has meant that vendors have had to find other ways to differentiate their product. Currently many PC producers are trying to differentiate themselves based on their after-sales service. AST will make house calls if your computer requires technical support that cannot be done over the phone, Compaq will replace your computer if it cannot be fixed within 48 hours and IBM is now offering modem support for their PC's.

The participants intend to offer comprehensive after sales service remotely. However training could add substantially to the strength of their product offering. Firstly, it would differentiate them from the competition and secondly it could be an important aspect to the acceptance of the product.

The final aspect of the product offering that may detract from the ability to market the product is the maintenance fee. Currently in the strategy it is assumed that the maintenance fee will be charged from the day of implementation. This means that if the product is bought and

installed in May 1996 the customer will pay 3 months of maintenance to the end of the financial year, August 31, 1996 and then pay the full maintenance for the following year, September 1, 1996 till August 31, 1997. The standard in the industry is to begin charging maintenance from the day of implementation however there are some firms that will charge maintenance fees from the first full year of operation. However, some prospective clients may not appreciate paying maintenance on top of the purchase price. If the product was marketed from the perspective that maintenance until the beginning of the financial year was included in the purchase price this would be another selling feature.

The venture should be looking for other ways to differentiate themselves from the competition. As mentioned earlier in the study there are few barriers to entry in this industry and at any time another venture could enter the market and severely impact this venture's ability to market its product as unique. In addition to a unique product in terms of features this venture should be trying to set itself apart in terms of customer service both pre and post sales.

The third strategy which the participants intend to employ is rapid market penetration through aggressive marketing of the product. Through researching the market the participants were able to establish that the other vendors do not directly promote their products through advertising or direct sales. The proposed marketing strategy encompasses advertising, promotion and direct selling. Details of the marketing strategy are in Chapter III.

The major risk associated with the marketing strategy is that although the participants in the venture want to market the product aggressively there is no salesperson in the first year of the venture. With no salesperson employed, the responsibility for sales will primarily fall to the two employees with some assistance possibly from either Denis or Brian. The two employees, Dave H. and Steve M. will be primarily focused on developing the product; any diversion from this activity could jeopardize their ability to deliver the product on time. However the Cash Flow and other financial statements have assumed sales from May of Year One. In order to meet this target some effort will be required from the two employees.

The fourth element of the proposed business strategy is a level of investment that will allow the venture to grow. The participants believe that a great deal of their competition are either investing only to maintain their position in the marketplace or are milking the business by investing as little as possible. The participants feel that if their competition were investing to either lead or dominate the market that there would be more evidence of the other vendors moving to new technology. Details of the capital requirement and level of investment available are detailed in Chapter IV.

By starting the venture with a reasonably large personal investment the principals are perhaps exposing themselves to a large personal loss. If on the other hand the principals sought outside investors through the venture capital market they may lose control of the venture and compromise the future of the venture through the terms

required by the venture capitalists. Venture capitalists often require large returns within a short period of time. This affects the company's ability to retain profits for further growth and development.

This venture is also for the most part a family venture. The participants hope to capitalize on the various strengths and attributes of the various family members. The ability to provide the proposed features of the product come from the knowledge and background of the principals involved. This knowledge of both the latest technology combined with an understanding of the medical software industry is where the participants hope to gain another strategic advantage. The risk associated with this part of the strategy is that all members of the venture must continue their involvement in the venture. Family ventures are difficult due to the extra tension that is added to a business because of family relationships and loyalties. This venture could be exposed dramatically if either Brian or Denis or both decided that they did not want to participate.

The other risk to the success of the venture is the reliance on family members for staffing and operating the venture. As identified in Chapter IV there is a skill deficit in the area of small business management and marketing. The ability to manage the venture through the initial startup phase and through the difficult part of attaining the first sales is critical. Although Denis has experience in new ventures he currently resides in Calgary and it is not known to what extent he will be involved in the day to day operation of the venture.

Analysis of Contingencies

Based on the preceding discussion it is evident that there are some critical issues to overcome with the proposed strategy for this venture. In the following section contingencies will be built in to the original strategy and then the effect will be evaluated through revised financial statements.

The first risk that was identified was the timeline for the venture. It is difficult to asses or predict what will happen in the future in terms of the competition from new or existing vendors. However it is not possible to have the proposed participants, Dave H. and Steve M. start any earlier on the project than originally planned. The only variable that can be changed is the lack of a salesperson. A salesperson could be hired in December and start work in January 1996.

The salesperson's role would be primarily sales and marketing however they would also assist with training and post-sales support. This employee whose responsibility was other than development would assist in ensuring that Dave H. and Steve M. were able to remain focused on developing the product and meeting their deadline. It is assumed in the revised financial statements that the salesperson will be hired on the basis of a $30,000 retainer and 10 percent commission on sales. This is the same salary amount and commission that is forecast for Year Two and Year Three.

The second and third contingencies built into the financial statements surround the provision of the product itself. As noted in the previous section maintenance revenue has been counted for every sale including the year or part year in which the sale was made. For the revised financial statements this amount has been removed. This is based on the revised strategy to only charge maintenance for the first full year of use. This means that someone who purchases the system in May 1996 will not start paying maintenance till September 1995. The financial year for this venture is assumed to begin in September.

The other change in the revised financial statements is the provision of training. The cost of providing training has been added to the expense items for Years One, Two and Three. No provision for the salary expense of the training has been allocated as it is assumed that the sales person will conduct the majority of the training with assistance from Dave H. and Steve M. when the major development effort is complete. The breakdown for the training expense is as follows:

Table 20 - Analysis of Training Expenses

Item	Amount
1. Training Time • Billing - 2.5 hours • Scheduling + billing - 4 hours • Charting - 8 hours	Salesperson
2. Airfare - 30% of sales require travel by air. Average airfare	$650.00 @ 70% discount = $195.00
3. Meals - average of two meals	$36.00
4. Hotel - 55% of sales require overnight accommodation	$120.00 @ 55% discount = $54.00
5. Incidentals - parking, airport tax	$10.00
6. Mileage 70 % of sales require travel by car. Average expense @ $0.26 per km	$54.00 @ 30% discount = $37.80
Total average training cost per sale	**$332.80**

Following are the revised Pro Forma Financial Statements for Year One, Year Two and Year Three. The sales forecasts have not been adjusted in any way. Although it is possible that the number of sales would increase as a result of the revised strategy it is not possible to forecast with any degree of certainty the amount that the sales figures would change. The revised financial statements are more an indication of the effect of the lost revenue from sales and the added expense of providing training. The changes to the financial statements are as follows:

- The maintenance revenue from sales made within that year is not counted. Only maintenance revenue for the first full year of use of the application is included.
- A salesperson has been added to the Year One expense projections. The salesperson is assumed to begin employment in January 1996.

- All three years of expense projections now include the expense of providing training. For each sale an additional expense of $333 has been added.

Table 21 - Revenue Forecasts Years One through Three including contingencies

Revenue Forecast Year One	**Worst**	**Likely**	**Best**
Segment One			
Sales	1585	3170	6339
Maintenance	0	0	0
Segment Two			
Sales	7392	14785	29569
Maintenance	0	0	0
Segment Three			
Sales	8116	16232	32463
Maintenance	0	0	0
Promotional Sales @ 50%			
Billing Module	1225	2450	3675
Scheduling Module	2650	3975	5300
Charting Module	3875	11625	19375
Contract Work	6500	22750	45500
Total Revenue	**$31,343**	**$74,986**	**$142,222**

Revenue Forecast Year Two	**Worst**	**Likely**	**Best**
Segment One			
Sales	6398	12796	25592
Maintenance	732	1465	2930
Segment Two			
Sales	29800	59600	119200
Maintenance	3447	6895	13789
Segment Three			
Sales	96100	192200	384400
Maintenance	3142	6283	12566
Promotional Sales @ 50%			
Billing Module	1225	2450	3675
Scheduling Module	2650	3975	5300
Charting Module	11625	15500	19375
Contract Work	0	0	0
Total Revenue	**$155,119**	**$301,164**	**$586,827**

Revenue Forecast Year Three	**Worst**	**Likely**	**Best**
Segment One			
Sales	6513	13027	26053
Maintenance	3716	7432	14865
Segment Two			
Sales	30030	60061	120122
Maintenance	17344	34689	69377
Segment Three			
Sales	97030	194060	388120
Maintenance	40342	80683	161366
Promotional Sales @ 50%			
Billing Module	613	1225	1838
Scheduling Module	1325	1988	2650
Charting Module	5813	7750	9688
Contract Work	0	0	0
Total Revenue	**$202,726**	**$400,914**	**$794,078**

Table 22 - Expense Projections Years One through Three including contingencies

Expense Projections Year One	**Worst**	**Likely**	**Best**
One time Start up expense	8500	8500	8500
Salary Expense			
Sales person including commission	21809	23519	26937
Developer One 50,000 @ 83%	41500	41500	41500
Developer Two 50,000 @ 66%	33500	33500	33500
Office supplies	4000	4000	4000
Telephone	10000	10000	10000
Lease Equipment	1200	1200	1200
Marketing Expense			
Advertising	7000	7000	7000
Promotion	6000	6000	6000
Packaging @ $50 per module shipped			
Billing	155	309	518
Scheduling	457	813	1426
Charting	205	509	919
Training Costs travel costs			
Billing	363	726	1452
Billing plus scheduling	1708	3417	6833
Charting	697	1395	2790
Maintenance Cost			
Billing	327	654	1308
Scheduling	1667	3335	6669
Charting	1571	3142	6283
Total Expenses	**$140,659**	**$149,518**	**$166,835**

Expense Projections Year Two	**Worst**	**Likely**	**Best**
Salary Expense			
Sales person including commission	43230	56460	82919
Developer One 52,500	52500	52500	52500
Developer Two 52,500	52500	52500	52500
Office supplies	6000	6000	6000
Lease Equipment	2400	2400	2400
Telephone	15000	15000	15000
Marketing Expense			
Advertising	14000	14000	14000
Promotion	11600	11600	11600
Packaging @ $50 per module shipped			
Billing	322	644	1188
Scheduling	1234	2368	4536
Charting	1540	2880	5460
Training Expense			
Billing	1479	2957	5914
Scheduling plus billing	6886	13773	27546
Charting	8258	16517	33034
Maintenance Cost			
Billing	1659	3318	6636
Scheduling	9679	19358	38715
Charting	20171	40342	80683
Total Expenses	**$248,458**	**$312,615**	**$440,631**

Expense Projections Year Three

Salary Expense			
Sales person including commission	43357	56715	83430
Developer One 52,500	55125	55125	55125
Developer Two 52,500	55125	55125	55125
Office supplies	9000	9000	9000
Lease Equipment	3600	3600	3600
Telephone	15000	15000	15000
Marketing Expense			
Advertising	21000	21000	21000
Promotion	11600	11600	11600
Packaging @ $50 per module shipped			
Billing	276	552	1054
Scheduling	1142	2234	4368
Charting	1402	2704	5258
Training Expense			
Billing	1505	3010	6021
Scheduling plus billing	6940	13879	27759
Charting	8338	16677	33353
Maintenance Cost			
Billing	3015	6030	12060
Scheduling	14516	30323	60645
Charting	38898	77902	153114
Total Expenses	**$289,840**	**$380,475**	**$557,511**

Table 23 - Summary Profit and Loss including contingencies

Summary Profit and Loss Year One	**Worst**	**Likely**	**Best**
Total Revenue	$31,343	$74,986	$142,222
Total Expenses	$140,659	$149,518	$166,835
Net Profit (Loss) before Taxes	**($109,316)**	**($74,532)**	**($24,613)**
Summary Profit and Loss Year Two	**Worst**	**Likely**	**Best**
Total Revenue	$155,119	$301,164	$586,827
Total Expenses	$248,458	$312,615	$440,631
Net Profit (Loss) before Taxes	**($93,338)**	**($11,452)**	**$146,197**
Summary Profit and Loss Year Three	**Worst**	**Likely**	**Best**
Total Revenue	$202,726	$400,914	$794,078
Total Expenses	$289,840	$380,475	$557,511
Net Profit (Loss) before Taxes	**($87,114)**	**$20,439**	**$236,567**

The addition of the three contingencies has affected the financial projections for the venture quite substantially. The venture is now not profitable until the third year of operation under the Likely scenario. In addition under the Likely scenario, $50,000 is no longer enough to sustain the venture through the first year of operation. There is a negative cash balance of $36,238 at the end of the first year of operations and there is not a positive cash balance until February of Year Three. (See appendixes E, F and G for the Cash Flow projections including contingencies).

As a result there is a greater requirement for the initial investment. Instead of $50,000 it is likely that as much as $100,000 would be required. With an investment that is almost double in size the pay back period is likely to be almost twice as long as the original forecast. This is

because the sales figures and revenue have not been adjusted in any way from the original projections. With a longer payback period this heightens the risk of the investment.

In addition the returns on the investment are smaller. Instead of the large returns starting in Year Two the new financial projections would indicate that there will be no positive returns on the investment until Year Three and this will be modest in comparison with the original projections. The pre-tax return for Year Three is only 20 percent.

Although all three contingencies have affected the financial outcomes, the most significant impact has come not from the addition of the training expense as might be expected but from the change in way maintenance revenue is collected. Detailed below is a summary in the changes in the Profit and Loss Statements between the two different sets of Pro Formas for the Likely scenario.

Table 24 - Analysis of Profit and Loss Pro Forma

Year	**Profit (Loss)**	**Profit (Loss) including contingencies**	**Variance**
One	($35,700)	($74,532)	$38,832
Two	$109,778	($11,452)	$121,230
Three	$139,339	$20,439	$118,900
Total			**$278,962**

In Year One the primary difference in financial projections comes from the addition of the salesperson, $23,519 and the change in the maintenance revenue, $9775. In Year Two the primary change in the

financial position comes from the change in the maintenance revenue, $87,983. The addition of the training expense affected the profitability by a further, $33,247. In Year Three again the major difference was the maintenance revenue, $85,334.

Alternative Strategies

There are three important issues to address in terms of strategy. First there is the issue of the venture being the first to market with the product that is unique in terms of features. Second, there is the issue of providing comprehensive customer service and third there is the issue of financing.

Being first to the market with the product is critical to the success of the venture so it would seem reasonable to employ a salesperson in the first year. The impact on the bottom line is approximately, $23,519, however without the additional manpower support the timeline of the venture could be severely jeopardized.

The second issue is customer service. Training would differentiate the venture from most of the competition and ensure that they are competing head to head with Osler. Although training would have the appearance of being extremely expensive the added value to the product offering is substantial and the added cost is less than 9 percent of revenue for Year Three and 11 percent for Year Two. In addition it may be possible to rationalize the training expense and the sales expense.

If the sales effort was concentrated geographically it may be possible to rationalize the training expense. If, for example the salesperson concentrated on the Lower Mainland for the first year of operations then the majority of the sales would be local. This would have three benefits. First it would simplify the sales effort. The sales person would be able to focus very specifically on the local market. This would enable them to learn a great deal about the market; who is looking for systems, which physicians talk to which physicians, where the greatest opportunities are and which vendors are moving in the market.

The second benefit would be that it would provide reference sites that are readily available for prospective new sites. Prospective clients would be able to visit sites that are already installed. Reference sites will be very important in the initial sales effort and the more these sites can be cultivated the better the opportunity for future sales.

The third benefit of focusing the sales effort is that the expense associated with training could be rationalized. If the local market was the initial focus then training expenses associated with those sites would be minimized. The biggest expenses would be mileage and parking. The average training cost per site would more likely be $50 as opposed to $333. In addition the majority of the market is concentrated in the Lower Mainland so the ability to attract the same number of sales as originally forecast would not be compromised.

As the venture became more established the marketing effort could be broadened to include the interior of BC and Vancouver Island. When

the venture is more established a larger training expense would not impact the cash flow of the company as markedly as there would be an established revenue stream from maintenance fees. The other alternative would be to hold the training sessions in Vancouver or charge a higher license fee for clients that were located outside of a certain radius of the Lower Mainland.

The participants should also consider other options to their product offering to differentiate themselves from the competition and potential competition. Other options they could consider would be providing more than the software to their clients. It is possible that many clients who are purchasing the software may also decide at the same time to upgrade their hardware. This would open up the opportunity to provide the clients with a service to assist with the process of purchasing and setting up the hardware. In addition if the venture formed a relationship with a hardware vendor they may be able to offer the clients a discounted price for the hardware.

The additional service of setting up the hardware could potentially be another revenue source or it could be added to the training as part of the purchase price. Either way it would add additional value to the product offering and further differentiate the venture from the competition. None of the vendors currently offer technical support for the setup of the hardware. This could be a particularly important service when it comes to setting up the system with the Charting Module as it is likely that it will require multiple PC's networked to a server PC.

The third issue that must be addressed in terms of the strategy is financing. The participants feel confident that they will be able to raise approximately $50,000 in start-up capital. Under the initial financial forecasts this amount appeared to be sufficient to cover their expenditures until there was a sufficient cash flow from sales and maintenance revenues. However under the revised financial statements their start-up requirements were increased to almost $100,000.

Rather than trying to raise the additional $50,000 themselves the participants should consider other options. One option would be attract another partner in the venture. The types of partners that may be interested would be other companies who work in the medical/physician practice market. This would include private laboratories, private radiology clinics, and vendors of laboratory or radiology systems.

Private laboratories, private radiology clinics and vendors of laboratory or radiology software would be interested in a strategic relationship for the same reason. As outlined in Chapter III the direction of medical office systems is towards the electronic medical record. To provide all of the information contained on a paper chart on a computer system ideally involves the interaction between clinical systems such as a laboratory system and the clinic system. If the vendor of the other system such as the laboratory system has no formal relationship with the developers of the clinic system then this process of developing the interface is extremely complicated and can be expensive. If on the other hand there is some agreement between the different vendors then information can be shared and interfaces developed in conjunction with

each other. This then becomes an additional selling feature for the clinic system and for the laboratory vendor or private lab.

Although there would be benefits to be gained from a joint marketing effort and from an additional capital infusion there are some disadvantages to this type of strategic alliance. First the participants could potentially lose some control of the company and the product direction. The Lab or medical software vendor may be anxious to see the functionality associated with the interface between the two products and jeopardize the product development of some of the other features.

Second in a joint marketing effort it may convey the incorrect messages about the clinic system. Physicians may incorrectly assume that the clinic system does not operate without the lab or radiology system or they may think that the clinic system only interfaces to a specific lab or radiology system.

A strategic alliance of this sort should be entered into only after careful consideration. The participants must establish clearly what their expectations are regarding the alliance and the other party should do the same. The participants should also consider building an exit plan into the agreement in case the alliance in unsuccessful.

Chapter VI

Conclusion

The participants should proceed with the proposed venture. The analysis of the venture indicates that the venture is feasible and the participants will be able to realize their objectives.

The initial financial analysis indicated that the investors would be able to recoup their investment of $50,000 within two years and make a reasonable return on their investment into the third year. Even with the added expenses built into the second set of financial statements and the maintenance revenue reduced the venture was projected to realize a profit in the third year.

However to ensure the success of the venture the participants should modify their strategy in the following manner.

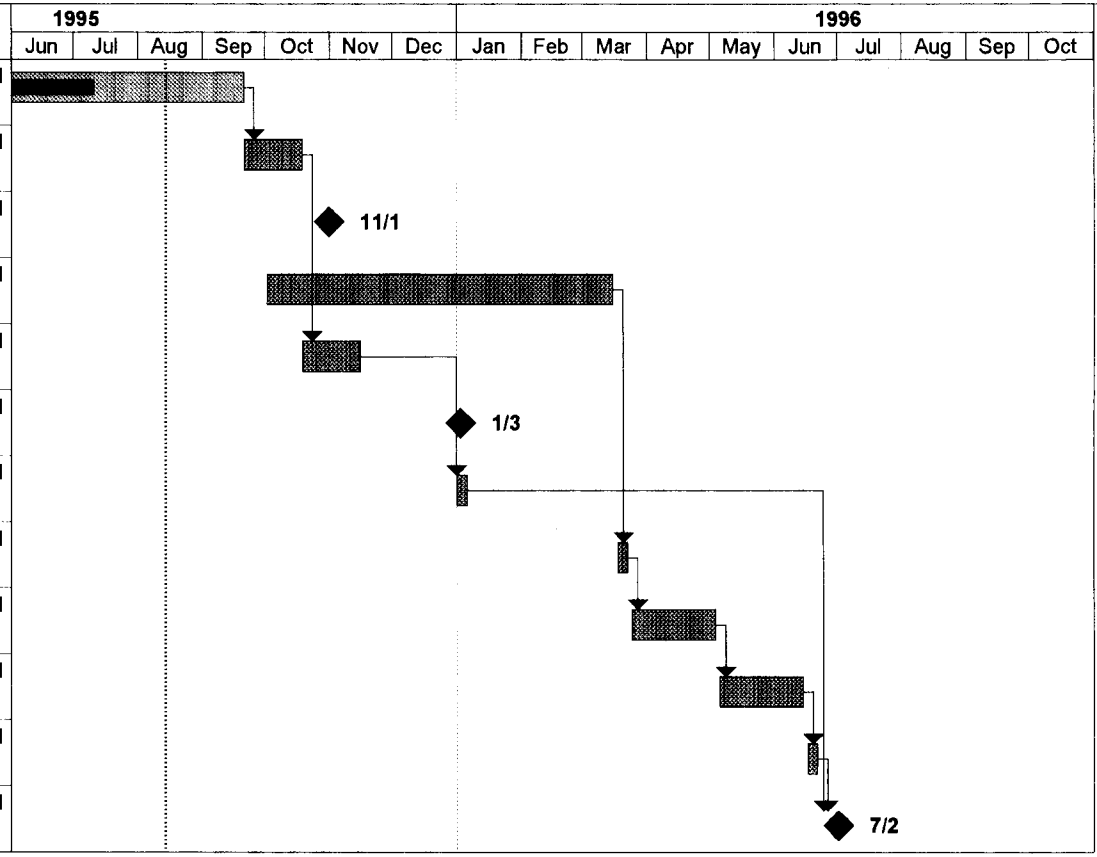
- A salesperson should be hired in the first year. The objective of the venture is to enter the market aggressively and without a person focusing on the sales effort either the development of the product will be compromised or the sales will be compromised.
- The participants should offer training with their product. Training differentiates the venture from the competition and it will also help ensure that the product is properly and fully utilized.
- The venture should consider other ways to differentiate the product from the competition. This could include providing technical assistance with the purchase and set up of the hardware.

- To minimize the training expense and to concentrate the sales effort the marketing of the product should focus locally first and then as the venture becomes established the market base can be broadened to include other parts of British Columbia.
- Maintenance should be charged from the time of implementation. Without maintenance revenue from the time of implementation the bottom line was severely affected. Charging maintenance is the standard in the industry and unless there is an adverse reaction from the market this venture should stay with the standard.
- Before looking for a strategic partner the participants should investigate all other alternative forms of financing. Government grants and subsidies should be considered first and secondly banks should be approached for the bridging finance required. The cash flow analyses with and without the contingencies indicate that the venture will eventually be self financing. For this reason financial institutions that provide short term financing would be the most appropriate.

Provided that the venture follows the initial strategy with the modifications outlined above there would appear to be no reason why the participants should not proceed with acquiring the capital required and beginning development of the product. The timeline for this venture is critical and to ensure that the window of opportunity is not missed the venture should begin gearing up immediately.

Appendix A

ID	Task Name	Duration
1	Phase One Product Development	80d
2	Phase One beta testing	20d
3	Dave H. starts full time employment	0d
4	Phase Two Product Development	120d
5	Beta fixes	20d
6	Steve M. starts full time employment	0d
7	Install Phase One into other Beta sites	5d
8	Install Phase Two in Beta site	5d
9	Phase Two Beta testing	30d
10	Phase Two beta fixes	30d
11	Install Phase Two into other Beta sites	5d
12	Product Launch all Phases	0d



Project:
Date: Aug 14 '95

Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress

Appendix B

	Cash Flow Projection Year One Likely Scenario									
	September	December	January	February	March	April	May	June	July	August
Receipts										
Contract Work	1896	1896	1896	1896	1896	1896	1896	1896	1896	1896
Sales Segment One	0	0	0	0	0	0	780	780	780	780
Sales Segment Two	0	0	0	0	0	0	3646	3646	3646	3646
Sales Segment Three	0	0	0	0	0	0	0	0	0	8618
Promotional Sales	0	0	2394	2394	2394	2394	6533	6533		
Total Receipts	1896	1896	4290	4290	4290	4290	12855	12855	6323	14941
Disbursements										
Startup expense	8500									
Salaries	0	4150	8338	8338	8338	8338	8338	8338	8338	8338
Office Expenses	333	333	333	333	333	333	333	333	333	333
Telephone	0	1000	1000	1000	1000	1000	1000	1000	1000	1000
Lease Equipment	100	100	100	100	100	100	100	100	100	100
Advertising									7000	
Promotion								6000		
Packaging			204	204	204	204	204	204	204	204
Maintenance Expense			891	891	891	891	891	891	891	891
Total Disbursements	8933	5583	10866	10866	10866	10866	10866	16866	17866	10866
Month Cash Surplus/Deficit	-7038	-3688	-6576	-6576	-6576	-6576	1989	-4011	-11543	4075
Beginning Cash Balance	50000	40738	37050	30474	23897	17321	10744	12733	8723	-2821
Ending Cash Balance	42963	37050	30474	23897	17321	10744	12733	8723	-2821	1254

Appendix C

	Cash Flow Projection Year Two Likely Scenario									
	September	December	January	February	March	April	May	June	July	August
Receipts										
Contract Work	0	0	0	0	0	0	0	0	0	0
Sales Segment One	780	1561	1561	1561	1561	1561	1561	1561	1561	1561
Sales Segment Two	1519	7278	7278	7278	7278	7278	7278	7278	7278	7278
Sales Segment Three	9541	21190	21190	21190	21190	21190	21190	21190	21190	21190
Promotional Sales	7197	7197	0	0	0	0	0	0	0	0
Total Receipts	19038	37227	30030	30030	30030	30030	30030	30030	30030	30030
Disbursements										
Salaries	13455	13455	13455	13455	13455	13455	13455	13455	13455	13455
Office Expenses	500	500	500	500	500	500	500	500	500	500
Telephone	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
Lease Equipment	200	200	200	200	200	200	200	200	200	200
Advertising			7000							
Promotion	5000							6600		
Packaging	491	491	491	491	491	491	491	491	491	491
Maintenance Expense	5251	5251	5251	5251	5251	5251	5251	5251	5251	5251
Total Disbursements	26147	21147	28147	21147	21147	21147	21147	27747	21147	21147
Month Cash Surplus/Deficit	-7109	16079	1883	8883	8883	8883	8883	2283	8883	8883
Beginning Cash Balance	1254	18050	34129	36012	44894	53777	62659	71542	73825	82707
Ending Cash Balance	-7109	34129	36012	44894	53777	62659	71542	73825	82707	91590

Appendix D

	Cash Flow Projection Year Three Likely Scenario									
	September	December	January	February	March	April	May	June	July	August
Receipts										
Contract Work	0	0	0	0	0	0	0	0	0	0
Sales Segment One	1561	2085	2085	2085	2085	2085	2085	2085	2085	2085
Sales Segment Two	7278	9646	9646	9646	9646	9646	9646	9646	9646	9646
Sales Segment Three	21190	27590	27590	27590	27590	27590	27590	27590	27590	27590
Promotional Sales	1199	1199	1199	1199	1199	1199	1199	1199	1199	1199
Total Receipts	31229	40521	40521	40521	40521	40521	40521	40521	40521	40521
Disbursements										
Salaries	13914	13914	13914	13914	13914	13914	13914	13914	13914	13914
Office Expenses	750	750	750	750	750	750	750	750	750	750
Telephone	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
Lease Equipment	300	300	300	300	300	300	300	300	300	300
Advertising			7000				7000			
Promotion	5000							6600		
Packaging	458	458	458	458	458	458	458	458	458	458
Maintenance Expense	9521	9521	9521	9521	9521	9521	9521	9521	9521	9521
Total Disbursements	31192	26192	33192	26192	26192	26192	33192	32792	26192	26192
Month Cash Surplus/Deficit	37	14328	7328	14328	14328	14328	7328	7728	14328	14328
Beginning Cash Balance	91590	21694	36022	43350	57678	72007	86335	93663	101392	115720
Ending Cash Balance	37	36022	43350	57678	72007	86335	93663	101392	115720	130048

Appendix E

	Cash Flow Projection Year One including Contingencies - Likely Scenario											
	September	October	November	December	January	February	March	April	May	June	July	August
Receipts												
Contract Work	1896	1896	1896	1896	1896	1896	1896	1896	1896	1896	1896	1896
Sales Segment One	0	0	0	0	0	0	0	0	634	634	634	634
Sales Segment Two	0	0	0	0	0	0	0	0	2957	2957	2957	2957
Sales Segment Three	0	0	0	0	0	0	0	0	0	0	0	8116
Promotional Sales	0	0	0	0	1606	1606	1606	1606	5813	5813		
Total Receipts	1896	1896	1896	1896	3502	3502	3502	3502	11299	11299	5487	13603
Disbursements												
Startup expense	8500											
Salaries	0	0	4150	4150	11277	11277	11277	11277	11277	11277	11277	11277
Office Expenses	333	333	333	333	333	333	333	333	333	333	333	333
Telephone	0	0	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Lease Equipment	100	100	100	100	100	100	100	100	100	100	100	100
Advertising											7000	
Promotion										6000		
Packaging					204	204	204	204	204	204	204	204
Training Expense					692	692	692	692	692	692	692	692
Maintenance Expense					891	891	891	891	891	891	891	891
Total Disbursements	8933	433	5583	5583	14498	14498	14498	14498	14498	20498	21498	14498
Month Cash Surplus/Deficit	-7038	1463	-3688	-3688	-10996	-10996	-10996	-10996	-3199	-9199	-16011	-896
Beginning Cash Balance	50000	42963	44425	40738	37050	26054	15058	4062	-6934	-10133	-19331	-35343
Ending Cash Balance	42963	44425	40738	37050	26054	15058	4062	-6934	-10133	-19331	-35343	-36238

Appendix F

	Cash Flow Projection Year Two including Contingencies - Likely Scenario											
	September	October	November	December	January	February	March	April	May	June	July	August
Receipts												
Contract Work	0	0	0	0	0	0	0	0	0	0	0	0
Sales Segment One	634	1188	1188	1188	1188	1188	1188	1188	1188	1188	1188	1188
Sales Segment Two	1232	5541	5541	5541	5541	5541	5541	5541	5541	5541	5541	5541
Sales Segment Three	9039	16540	16540	16540	16540	16540	16540	16540	16540	16540	16540	16540
Promotional Sales	5481	5481	5481	5481	0	0	0	0	0	0	0	0
Total Receipts	16386	28751	28751	28751	23270	23270	23270	23270	23270	23270	23270	23270
Disbursements												
Salaries	13455	13455	13455	13455	13455	13455	13455	13455	13455	13455	13455	13455
Office Expenses	500	500	500	500	500	500	500	500	500	500	500	500
Telephone	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
Lease Equipment	200	200	200	200	200	200	200	200	200	200	200	200
Advertising		7000			7000							
Promotion	5000									6600		
Packaging	491	491	491	491	491	491	491	491	491	491	491	491
Training Expense	2771	2771	2771	2771	2771	2771	2771	2771	2771	2771	2771	2771
Maintenance Expense	5251	5251	5251	5251	5251	5251	5251	5251	5251	5251	5251	5251
Total Disbursements	28918	30918	23918	23918	30918	23918	23918	23918	23918	30518	23918	23918
Month Cash Surplus/Deficit	-12532	-2167	4833	4833	-7648	-648	-648	-648	-648	-7248	-648	-648
Beginning Cash Balance	-36238	-12532	-14699	-9866	-5032	-12680	-13328	-13976	-14625	-15273	-22521	-23169
Ending Cash Balance	-12532	-14699	-9866	-5032	-12680	-13328	-13976	-14625	-15273	-22521	-23169	-23817

Appendix G

	Cash Flow Projection Year Two including Contingencies - Likely Scenario											
	September	October	November	December	January	February	March	April	May	June	July	August
Receipts												
Contract Work	0	0	0	0	0	0	0	0	0	0	0	0
Sales Segment One	634	1188	1188	1188	1188	1188	1188	1188	1188	1188	1188	1188
Sales Segment Two	1232	5541	5541	5541	5541	5541	5541	5541	5541	5541	5541	5541
Sales Segment Three	9039	16540	16540	16540	16540	16540	16540	16540	16540	16540	16540	16540
Promotional Sales	5481	5481	5481	5481	0	0	0	0	0	0	0	0
Total Receipts	16386	28751	28751	28751	23270	23270	23270	23270	23270	23270	23270	23270
Disbursements												
Salaries	13455	13455	13455	13455	13455	13455	13455	13455	13455	13455	13455	13455
Office Expenses	500	500	500	500	500	500	500	500	500	500	500	500
Telephone	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
Lease Equipment	200	200	200	200	200	200	200	200	200	200	200	200
Advertising		7000			7000							
Promotion	5000									6600		
Packaging	491	491	491	491	491	491	491	491	491	491	491	491
Training Expense	2771	2771	2771	2771	2771	2771	2771	2771	2771	2771	2771	2771
Maintenance Expense	5251	5251	5251	5251	5251	5251	5251	5251	5251	5251	5251	5251
Total Disbursements	28918	30918	23918	23918	30918	23918	23918	23918	23918	30518	23918	23918
Month Cash Surplus/Deficit	-12532	-2167	4833	4833	-7648	-648	-648	-648	-648	-7248	-648	-648
Beginning Cash Balance	-36238	-12532	-14699	-9866	-5032	-12680	-13328	-13976	-14625	-15273	-22521	-23169
Ending Cash Balance	-12532	-14699	-9866	-5032	-12680	-13328	-13976	-14625	-15273	-22521	-23169	-23817

Bibliography

Aaker, David. *Developing Business Strategies.* 3rd Edition. Berkely: John Wiley & sons Inc., 1992.

Ball, Marion J., Douglas, Judith V., Silva, John S., "Toward the Healthcare Professional Workstation", *Computers in Healthcare,* 14 (10).

Bell, Andrew. "$1.93 Billion looking for a Home", *Globe and Mail,* March 17, 1995.

Betts, Mitch. "Doctors Prescribe Software for Patient Woes", *Computerworld,* 28 (8).

Cornelius, Mark. "Why endure frustration? Medical Records need cooperative overhaul.", *Modern Healthcare,* 23 (9).

Coy, Peter. "Faster, Smaller, Cheaper", *Business Week.* (372)

Cullen, June. "Prospects for Establishing a Small Business in British Columbia's Information Technology Industry", Project submitted in partial fulfillment of the requirements for the degree of Master of Business Administration, Vancouver: University of Simon Fraser University, 1993.

Davis, Michael. "Reaping the Benefits of Electronic Medical Record Systems", *Healthcare Financial Management.* 47 (6).

DeHayes, Daniel W., Hoffer, Jeffrey A., Perkins, Williams C., *Managing Information Technology.* 5th Edition. Toronto: MacMillan Publishing, 1994.

Department of Finance. *Budget in Brief.* Ottawa: Department of Finance Publication, 1995.

Department of Finance. *Creating a Healthy Fiscal Environment.* Ottawa: Department of Finance Publication, 1995.

Department of Industry, Science and Technology. *A First Review of the Performance of Canada's Software Products Industry.* Ottawa: Department of Industry, Science and Technology publication, 1994.

Department of Industry, Science and Technology. *Software Developers 1992.* Ottawa: Department of Industry Science and Technology publication, 1992.

Hagland, Mark. "HIMSS '94", *Hospitals and Healthcare Networks.* 69 (3).

Huber, Peter. "Software's cash Register", *Forbes 400.* 152 (9).

Lohman, Philip, Sundeen, Maria. "Survey Results Indicate CPR is Making Headway", *Health Management Technology,* 15 (11).

Lumsden, Kevin. "Computerized Patient Records Gain Converts", *Hospitals and Health Networks.* 67 (7).

Ministry of Employment and Immigration. *Software and National Competitiveness.* Ottawa: Employment and Immigration Canada publication, 1992.

Ministry of Small Business, Toursim and Culture. *Small Business Profile.* Victoria: Ministry of Small Business, Tourism and Culture Publication, 1992.

O'Reilly, Michael. "Healthcare begins to Merge with the Information Highway", *Canadian Medical Association Journal.* 151 (8).

Rowan, Geoffrey. "Computer Firms' Profits Soar", *Globe and Mail.* April 25, 1995.

Rozovsky, Lorne, Rozovsky, Fay. *The Canadian Law of Patient Records.* Toronto: Butterworths, 1984.

Ruffin, Marshall. "Medical Informatics", *Healthcare Journal Forum.* 36 (2).

Tym, Peter. "Portable Technology", *Globe and Mail.* July 4, 1995.

Unkown, "Groups crowd the On-ramp for the Information Superhighway", *Medical Economics,* 72 (5).

Wheelwright, Geof. "Microsoft Win 95 Strategy Courts Corporations", *The Computer Paper.* August 1995.

Zeidenberg, Jerry. "How Banks Target High Tech", *Globe and Mail.* February 27, 1995.

Zeidenberg, Jerry. "Venture Capital Not for Everyone", *Globe and Mail.* May 1, 1995.