

INFORMATION SYSTEMS PLANNING IN A CHARITABLE ORGANIZATION

by

STEVEN BRENT FERGUSON

B.Comm., Carleton University, 1990

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF

THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE in BUSINESS ADMINISTRATION

in
THE FACULTY OF GRADUATE STUDIES

THE FACULTY OF COMMERCE AND BUSINESS ADMINISTRATION

(Management Information Systems Program)

We accept this thesis as conforming
to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA

July 1994

Steven Brent Ferguson, 1994

In presenting this thesis in partial fulfilment of the requirements for an advanced degree at the University of British Columbia, I agree that the Library shall make it freely available for reference and study. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by the head of my department or by his or her representatives. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.

(Signature)

Department of Commerce

The University of British Columbia
Vancouver, Canada

Date March 1 / 94

ABSTRACT

The thrust of this thesis is a practical one, namely, how to do information systems planning in a small charitable organization. There are two relevant bodies of literature to be considered. The first is the Strategic Information Systems Planning (SISP) literature. The traditional methodologies recommended in this literature tend to be driven by business objectives moving from the identification of information requirements to the selection of supporting information technology (IT). The second body of literature, Business Process Reengineering (BPR), is growing rapidly, at least in part because it seeks to counter the criticism that the application of IT in organizations has in the past failed to deliver productivity gains. The BPR approach views IT as enabling the removal of constraints that are the result of out-dated organizational processes. Upon reviewing the SISP and BPR literature, it became apparent that both lacked the necessary operational specifics for straight forward application in the setting being studied. In particular, it was not clear how to integrate the process focused BPR and the more functional SISP methodologies, or how either could be applied in a charitable organization. The contributions to be made by this thesis include a description of an IS planning project done with the B.C. and Yukon Division of the Canadian Cancer Society, and a discussion of a proposed integrated approach called Organizational Information Systems Planning (OISP).

TABLE OF CONTENTS (Summary)

ABSTRACT	- ii -
TABLE OF CONTENTS	- iii -
LIST OF TABLES	- vii -
LIST OF FIGURES	- viii -
1. INTRODUCTION	- 1 -
1.1 MOTIVATION	- 1 -
1.2 BACKGROUND	- 1 -
1.3 RESEARCH QUESTIONS	- 2 -
1.4 CONTRIBUTION	- 3 -
1.5 ORGANIZATION	- 3 -
2. LITERATURE REVIEW	- 5 -
2.1 STRATEGIC INFORMATION SYSTEMS PLANNING	- 5 -
2.2 BUSINESS PROCESS REENGINEERING	- 15 -
3. CASE STUDY	- 22 -
3.1 INTRODUCTION	- 22 -
3.2 ORGANIZATIONAL OVERVIEW	- 24 -
3.3 IS PLANNING APPROACH	- 40 -
3.4 FUTURE CONSIDERATIONS	- 63 -
4. THEORY	- 65 -
4.1 INTEGRATION OF SISP & BPR	- 65 -
4.2 OISP IN A CHARITABLE ORGANIZATION	- 79 -
4.3 OISP & THE CCS	- 82 -
4.4 THEORY SUMMARY	- 88 -
5. CONCLUSIONS	- 90 -
5.1 SUMMARY	- 90 -
5.2 CASE STUDY & THEORY LINKAGES	- 90 -
5.3 SPECIAL CIRCUMSTANCES	- 92 -
5.4 LIMITATIONS	- 93 -
5.5 FUTURE DIRECTIONS	- 94 -
BIBLIOGRAPHY	- 95 -
APPENDICES	- 98 -

TABLE OF CONTENTS (Detailed)

ABSTRACT	- ii -
TABLE OF CONTENTS	- iii -
LIST OF TABLES	- vii -
LIST OF FIGURES	- viii -
1. INTRODUCTION	- 1 -
1.1 MOTIVATION	- 1 -
1.2 BACKGROUND	- 1 -
1.3 RESEARCH QUESTIONS	- 2 -
1.4 CONTRIBUTION	- 3 -
1.5 ORGANIZATION	- 3 -
2. LITERATURE REVIEW	- 5 -
2.1 STRATEGIC INFORMATION SYSTEMS PLANNING	- 5 -
2.1.1 Importance	- 5 -
2.1.2 Definition	- 5 -
2.1.3 Objectives	- 6 -
2.1.4 Benefits	- 7 -
2.1.5 Preconditions	- 7 -
2.1.6 Components	- 8 -
2.1.7 Contents	- 8 -
2.1.8 Approaches	- 9 -
2.1.9 Methodology	- 11 -
2.1.10 Management	- 14 -
2.2 BUSINESS PROCESS REENGINEERING	- 15 -
2.2.1 Importance	- 15 -
2.2.2 Definition	- 16 -
2.2.3 Processes	- 16 -
2.2.4 Motivation	- 17 -
2.2.5 Approaches	- 17 -
2.2.6 Methodology	- 18 -
2.2.7 Management	- 20 -
3. CASE STUDY	- 22 -
3.1 INTRODUCTION	- 22 -
3.1.1 Project Objectives	- 22 -
3.1.2 Overall Approach	- 22 -
3.1.3 Terminology	- 23 -
3.1.4 Report Layout	- 24 -

3.2 ORGANIZATIONAL OVERVIEW	- 24 -
3.2.1 Mission & Priorities	- 24 -
3.2.2 Structure & Supporting Systems	- 27 -
3.2.2.1 Financial Development	- 28 -
3.2.2.2 Patient Services	- 28 -
3.2.2.3 Lodges	- 29 -
3.2.2.4 Public Education	- 29 -
3.2.2.5 Public Relations	- 30 -
3.2.2.6 Human Resources	- 30 -
3.2.2.7 Administrative Services	- 31 -
3.2.2.8 Financial Services	- 31 -
3.2.2.9 Computer Services	- 32 -
3.2.2.10 District Services	- 32 -
3.2.2.11 District Offices	- 33 -
3.2.2.12 Unit Offices	- 34 -
3.2.3 Challenges	- 34 -
3.2.3.1 Environmental Changes	- 35 -
3.2.3.2 Organizational Issues	- 36 -
3.2.3.3 IS Issues	- 37 -
3.2.4 Overview Summary	- 39 -
3.3 IS PLANNING APPROACH	- 40 -
3.3.1 Guiding Principles	- 40 -
3.3.2 Sample Analysis	- 41 -
3.3.2.1 Objectives & Organization	- 42 -
3.3.2.2 Information Requirements	- 44 -
3.3.2.3 IS Infrastructure	- 49 -
3.3.2.4 Analysis Discussion	- 56 -
3.3.3 Organizational Implications	- 57 -
3.3.3.1 Planning Priorities	- 58 -
3.3.3.2 Reengineering Potential	- 61 -
3.3.4 Planning Summary	- 62 -
3.4 FUTURE CONSIDERATIONS	- 63 -
4. THEORY	- 65 -
4.1 INTEGRATION OF SISP & BPR	- 65 -
4.1.1 Base Models	- 65 -
4.1.2 Organizational Model	- 68 -
4.1.3 Analysis of SISP & BPR	- 71 -
4.1.4 The OISP Approach	- 73 -
4.1.5 Applying OISP	- 77 -
4.2 OISP IN A CHARITABLE ORGANIZATION	- 79 -
4.2.1 Dimensions	- 79 -
4.2.2 Implications	- 81 -

4.3 OISP & THE CCS	- 82 -
4.3.1 Promoters & Inhibitors	- 82 -
4.3.2 Ties to Planning Priorities	- 83 -
4.3.3 Links to Reengineering	- 84 -
4.4 THEORY SUMMARY	- 88 -
5. CONCLUSIONS	- 90 -
5.1 SUMMARY	- 90 -
5.2 CASE STUDY & THEORY LINKAGES	- 90 -
5.3 SPECIAL CIRCUMSTANCES	- 92 -
5.4 LIMITATIONS	- 93 -
5.5 FUTURE DIRECTIONS	- 94 -
BIBLIOGRAPHY	- 95 -
APPENDIX A: Program & District Objectives	- 98 -
APPENDIX B: Organization Chart & Committee Overlay	- 102 -
APPENDIX C: Division Office Systems	- 107 -
APPENDIX D: Data Processing Philosophy (1984)	- 116 -
APPENDIX E: Equipment Acquisition Policy (Sept. 1993)	- 118 -
APPENDIX F: Background for IS Challenges	- 121 -
APPENDIX G: Client-Server Computing	- 123 -

LIST OF TABLES

Table 1: Organizational Unit Involvement in Objective Achievement	- 42 -
Table 2: Description of Information Classes	- 44 -
Table 3: Importance of Information Class to Objective Achievement	- 45 -
Table 4: Creation and Use of Information by Organizational Unit	- 47 -
Table 5: Existing Custom Applications in each Information Class	- 49 -
Table 6: Custom Application Support for Organizational Objectives	- 50 -
Table 7: Custom Application Support for Organizational Units	- 51 -
Table 8: Existing Packaged Applications in each Application Category	- 52 -
Table 9: Typical Uses for Software in each Application Category	- 52 -
Table 10: Packaged Application Support for Organizational Objectives	- 53 -
Table 11: Packaged Application Support for Organizational Units	- 54 -
Table 12: Description of Organizational Components & Elements	- 68 -
Table 13: Summary of SISP and BPR approaches	- 71 -
Table 14: Strengths and Weaknesses of SISP and BRP approaches	- 71 -
Table 15: Principles Selected from SISP & BPR approaches	- 72 -
Table 16: Examples of Principles in Practice	- 73 -
Table 17: Summary of the OISP Approach	- 74 -
Table 18: Fundamental OISP Actions after Adoption	- 76 -
Table 19: Possible Initial Definitions	- 84 -
Table 20: Example Performance Measures	- 84 -
Table 21: Sample Ranking Criteria	- 85 -

LIST OF FIGURES

Figure 1: Summary of Revenues & Expenditures	- 25 -
Figure 2: Partial Organization Chart	- 26 -
Figure 3: Summary of Organizational Objectives	- 41 -
Figure 4: Common & Specific Information Classes	- 45 -
Figure 5: Barrett's Process Visualization Hierarchy	- 65 -
Figure 6: Hammer's Business System Diamond	- 66 -
Figure 7: Simple Organizational Model	- 67 -
Figure 8: B.C. & Yukon Division Activity Diagram	- 85 -

1. INTRODUCTION

1.1 MOTIVATION

The impetus for this thesis came from a project request made by the B.C. and Yukon Division of the Canadian Cancer Society (CCS) to assess its information systems (IS) needs. The project was defined to include a review of the Division's current systems and procedures, and an evaluation of the applicability of recent information technology (IT) advances. This request provided an excellent opportunity to gain a better understanding of IS planning in a charitable organization. Of particular interest was the potential to determine how the differences between a charitable organization and a typical business enterprise affect the planning process. The project was entered into with dual goals in mind. The first goal was to provide the B.C. and Yukon Division of the CCS with realistic IS planning recommendations. The second goal was to use the project as the basis for a more theoretical investigation of the implications for IS planning of being a charity.

1.2 BACKGROUND

A review of the relevant academic and professional IS literature was done in preparation for the project. It was clear that a segment of the traditional IS planning literature commonly referred to as Strategic Information Systems Planning (SISP) should be examined. Although there are a number of distinct SISP approaches, most tend to emphasize identifying applications and architectures that the organization should adopt. A growing body of literature that takes a somewhat broader organizational perspective is Business Process Reengineering (BPR). While given many different names such as Process Innovation or Critical Process Redesign by various authors, this more recent thinking focuses on improving organizational processes by eliminating

outdated rules and unnecessary organizational boundaries. It was decided that these two sets of literature together would provide a sufficient theoretical background for the project.

While working with the CCS, it became apparent that the existing SISP and BPR methodologies are difficult to combine, and not well suited for this specific organizational setting. It was not entirely clear how the project should be conducted, or even how to start. As a result, the methods used and the steps taken were decided upon as the project progressed. The initial phase of the project entailed documenting the Division's objectives, structure, and challenges. Although similar actions are frequently taken as a first step in many SISP approaches, they are not always an acknowledged part of BPR methodologies. The rest of the project focused on the development of a simplified planning approach that was used to analyze the information gathered during the initial phase in order to generate planning priorities. While some ideas were used from both SISP and BPR, it was discovered that it was much easier to choose one or the other as a base, which in this case turned out to be the more traditional SISP.

1.3 RESEARCH QUESTIONS

The project served to raise a number of important questions about SISP and BPR, the answers to which could not be found in the existing literature. The two key research questions that are addressed in this thesis are:

- 1) How can SISP and BPR be integrated?
- 2) How would such an integrated approach be applied in a charitable organization?

While the work done for the B.C. and Yukon Division of the CCS did not deal with these questions specifically, the experience has provided invaluable insights. Attempting to employ

both SISP and BPR concepts in the same project facilitated the evolution of the idea of using the underlying assumptions of each as a means of linking their methodologies. Moreover, the in-depth knowledge gained about the operations of the CCS helped guide the adaptation of a combined SISP and BPR approach for use in a charitable organization. Responding to these two questions should also contribute to the understanding of how SISP, BPR or an integrated approach can best be applied in other types of organizations.

1.4 CONTRIBUTION

The ideas presented in this thesis about integrating SISP and BPR and applying this new approach in a charitable organization are of significant value to both academics and practitioners. The two sets of literature around SISP and BPR are currently unconnected, yet there is an obvious need to explore the relationships between their central tenets. Clearly, academics in the MIS domain will benefit from increased knowledge about how key notions from SISP and BPR can be combined and applied in a real world setting. The majority of the literature to date tends to discuss the SISP and BPR approaches in the context of large for-profit corporations. In today's world, however, small enterprises play a key role in the economy, and non-profit organizations are increasingly important for community health. The professionals that manage these organizations need practical advice on how to do IS planning, and both the theoretical work and the recommendations made to the CCS are of value in that regard.

1.5 ORGANIZATION

The remainder of this thesis is organized into six principle sections, namely, Literature Review, Case Study, Theory, Conclusions, Bibliography, and Appendices. The Literature Review section summarizes the relevant SISP and BPR literature. The Case Study section

contains the text of the main body of the final project report presented to the B.C. and Yukon Division of the CCS. In the Theory section, an organizational model is used to integrate SISP and BPR concepts, and the resulting Organizational Information Systems Planning (OISP) approach is discussed in the context of charities and the CCS. The Conclusion section summarizes the results of the Case Study and Theory work, discusses limitations of the OISP approach, and suggests future research directions. This is followed by the Bibliography, and finally by Appendices that support the Case Study.

2. LITERATURE REVIEW

2.1 STRATEGIC INFORMATION SYSTEMS PLANNING

2.1.1 Importance

Information systems (IS) executives and practitioners consider IS planning to be critical to managing information technology (IT) in today's dynamic and uncertain environment (Conrath et. al. 1992, Earl 1993, Tayntor 1993). Advances in IT have presented IS managers with a vast array of opportunities to induce significant productivity gains by fundamentally altering the way an organization operates. However, failure to develop sound, strategic IS plans can result not only in lost opportunities but also in wasted IS resources (Lederer & Sethi 1992). Unless key decision makers internalize the necessity for rational planning, and determine just how IS and the related technological components can contribute to organizational outcomes, strategic investments are seldom made. Given the limited resources available in many organizations today, an all-encompassing planning initiative may not be feasible, yet not taking any action may put important organizational objectives at risk and can lead to an erosion of the IS asset base (Atkinson, 1992(a)). Therefore, engaging in meaningful strategic IS planning is essential to long-term organizational competitiveness.

2.1.2 Definition

A classic way of thinking about planning is the pyramid of strategic, tactical and operational planning, where strategic planning is associated with long-term forecasts, tactical with short-term objectives, and operational with implementation strategies. Strategic planning provides the basis for the development of the tactical and operational plans. Strategic IS planning (SISP) has been commonly defined as the process of identifying a portfolio of

computer-based applications that will assist an organization in executing its business plans and realizing its business goals (Lederer & Sethi 1992, Lederer & Gardiner 1992). More recently, Earl (1993) has defined SISP as "the process of deciding on objectives for organizational computing and identifying potential computer applications which an organization should implement." Earl's definition is somewhat broader thereby allowing for the inclusion of approaches to SISP that are not driven by business goals. This is not to say that general organizational goals are not important in these approaches, but it is a reflection of the emphasis placed on objectives.

2.1.3 Objectives

Prior to undertaking an SISP initiative it is essential that the organization first determine the root motivation and define the bottom-line benefits expected. The stakeholders in the process must be clear on the decisions they want to be able to make as a result of engaging in SISP (Atkinson 1991(a)). In this light, it has been suggested that SISP should facilitate the development of an information systems strategy, an information management strategy, and an information technology strategy (Earl 1993). Further, the literature recommends the following SISP objectives: aligning IS investment with business goals; seeking competitive advantage from IT; directing efficient and effective management of IS resources; developing technology policies and architectures; and gaining top management commitment. The challenge for the SISP team is to demonstrate how IS and the related technologies can make the greatest contribution to the effective and efficient operation of the organization.

2.1.4 Benefits

SISP gives IS managers the opportunity to identify broad initiatives, specific applications, and critical technologies to help their organizations carry out its strategies (Lederer & Gardiner 1992). It also offers managers the means to identify ways in which IS can be used to create new strategies, and the chance to develop a vision of the future of IT in the organization. By aligning IS and organizational needs, SISP facilitates the sharing of resources and data across the organization, which often leads to improved communication, understanding and support among top management, users and IS professionals (Conrath et. al. 1992, Earl 1993, Flaatten et. al. 1992). Meeting SISP objectives and obtaining the resulting benefits requires that certain preconditions are met, that all components be addressed, and that an appropriate approach and methodology be selected.

2.1.5 Preconditions

The motivation for an SISP initiative must be shared by a broad enough and powerful enough constituency of stakeholders to provide the process with sufficient direction, resources and ongoing support. Obtaining the necessary commitment can be ensured through the formation of a formal management steering committee to oversee the initiative, and a multidisciplinary team that includes members from all key areas of the organization (Atkinson 1992(a)). Involvement of top management, users, and IS personnel alone are not sufficient to ensure the success of SISP. Additional factors that facilitate the process include the existence of clear organizational goals, effective IS management, good IS-user relationships, and sufficient resources (Earl 1993, Tayntor 1993). More importantly, continual communication is essential to transforming a written plan into reality. Effective SISP requires that the organization follow a well-defined process that allows for completion of initiatives within established time frames.

2.1.6 Components

The SISP literature tends to emphasize the methodological component of planning. However, a recent empirical study by Earl (1993) suggests that there are three equally important ingredients for successful SISP, namely, method, process and implementation. Method includes the methodology employed and the supporting techniques and tools. Process refers to more general management related issues from project initiation and methodology selection through to completion. Implementation is the detailed follow-up on the strategies developed using the chosen methodology. In the past, the literature and strategic plans themselves have focused on the technical aspects of IS such as hardware and software. A customer focus is widely recognized as important in organizational planning efforts, yet it has been slow in coming to the SISP field (Tayntor 1993). With a customer-centric approach, the impetus for change would come from end users, where information requirements are determined first followed by the selection of the supporting hardware and software. Tayntor (1993) argues that this means planning should begin with the user interface rather than with the computing platform, which has been the traditional starting point for planning projects.

2.1.7 Contents

Before starting the actual planning process, the organization should define the desired contents of the strategic IS plan based on its own unique needs. Conrath et. al. (1992) suggests that the plan should include a statement of objectives, hardware plan, recommended implementation plan, systems development plan, financial plan, personnel plan, and facilities plan. Similarly, Lederer and Gardiner (1992) believe that the plan should define new applications, specify data bases, describe the network of hardware and software, estimate resource requirements, set priorities, and establish a migration plan. Atkinson (1992(a)) also

advises that the plan components include an information technology scan, a current IS portfolio description and evaluation, IS strategies, target data, applications and technology architectures, and a transition plan based on all of these.

Two components that should be included in every large organization's plan are an infrastructure plan and an information technology impact assessment. Infrastructure plans include plans for the development environment, the production environment and for personnel. Poor infrastructure planning can result in high maintenance workloads that lead to unresponsiveness. Further, the accumulation of disparate hardware and software may cause duplication of effort, and make development personnel less interchangeable (Flaatten et. al. 1992). The purpose of an IT impact assessment is to assess the potential of IT to enhance existing organizational outputs, create new products and services, and streamline or fundamentally reengineer internal operations. A well formulated and complete strategic IS plan will drive the IS operating budget and provide the supporting management rationale (Atkinson & Montgomery 1990).

2.1.8 Approaches

Some organizations choose to adopt one of the numerous popular approaches to SISP, while others adapt an existing approach to their needs or simply develop their own. Flaatten et. al. (1992) have suggested four categories of approaches to SISP. The first, which they call Application Portfolio Planning, represents the most traditional approach to systems planning. It entails reviewing the current state of the information systems, locating the greatest needs and opportunities, analyzing costs and benefits, and ranking projects by some priority scheme. In

such an approach, little thought is generally given to the integration of projects, which is a problem that the other classes of approaches attempt to resolve in different ways.

The second approach, Enterprise Modelling, involves analyzing current business processes and the data they use, and proposing new systems around clusters of shared data. The advantages of this type of approach are better integration and more stability, but the disadvantages are that it takes longer and that it is often difficult to get top management commitment for developing a base architecture. Flaatten et. al. suggest that this is the most popular approach today, and gives IBM's Business Systems Planning (BSP) as an example of a methodology that follows this approach. The third approach in the Flaatten et. al. classification is technology Infrastructure Planning. It concentrates on the resources required to implement and run applications including IS personnel, hardware and software, development tools, and telecommunications networks. They point out that Infrastructure Planning is also used to support other approaches. The final class of approaches suggested by Flaatten et. al. attempts to link business and technology strategies. They argue that this approach came about as a result of the analysis tools developed by Michael Porter that are intended to help an organization create a competitive advantage.

Another SISP approach classification scheme has been developed by Earl (1993). His scheme differentiates five approaches based on what he calls their underpinning assumptions including Business-Led, Method-Driven, Administrative, Technological and Organizational. Under the Business-Led approach, business planning drives SISP. The Method-Driven approach is dependent upon the use of a formal methodology, the Administrative approach conforms to management planning and control procedures, and the Technological approach assumes that an

information system-oriented model of the business is a necessary outcome of SISP. These four approaches were represented in the Flaatten et. al. framework, however, Earl's organizational approach is not covered by Flaatten et. al. or generally recognized in the SISP literature. The underpinning assumption of the Organizational approach is quite different. It is that SISP is not a special or neat and tidy endeavour, but is based on IS decisions being made through continuous interaction between the IS function and the organization.

2.1.9 Methodology

A pioneer in the SISP field, King (1978), developed an organization strategy driven methodology that served as the basis for many of the methods available today. His methodology focused on translating the organization's mission, objectives and strategy into system objectives, system constraints and a system design. King has also stated that successful planning for information systems should meet three criteria. First, planning should incorporate processes for relating IS strategy to the existing business strategy of the enterprise. Second, planning should incorporate processes for assessing the existing and planned IS resources of the organization with the objective of identifying potentially useful changes in business strategy, tactics or the processes that they may support. Finally, the organization should instill information and IS as a strategic resource or competitive weapon, and that planning should explicitly involve processes for the identification of opportunities for use of the information resource (Carter et. al. 1990).

Other authors, such as Laware (1991) and Atkinson (1991(a), 1991(b), 1992(b)) agree with King's stance. Laware argues that IS managers must understand, communicate, and show senior management how information and technological solutions can most effectively help the organization achieve its goals if SISP is to succeed. Similarly, Atkinson (1991(c)) comments

that repackaging organizational models to highlight vital performance measures and using these as a basis for determining where and how IT can best make essential contributions can greatly improve SISP. He also believes that the business strategy-centred approach is the most appropriate because the organization's key objectives and strategies can be used to define a reduced scope for the IS plan, which focuses the planning effort on enabling these organizational imperatives. Atkinson (1991(b)) suggests that the development of a business model is the key first step in SISP, which should be supported by a matrix analysis with business functions in value-chain sequence on one axis and information technologies on the other. Under this approach, insight occurs when the emerging patterns reveal one or more key technologies with both high impact and wide impact, which can be used to improve organizational alignment and define target architectures (Atkinson 1992(b)).

An eleven stage business-driven methodology called the Information System Master Architecture and Plan (ISMAP) has been proposed by Atkinson and Montgomery (1990). The first four stages can be started concurrently, and they entail developing business and IS models, along with describing both the current and target enterprise and technology. The fifth stage, assessing technology impact, and the sixth stage, evaluating current IS situation, can also be started concurrently after the first four stages are nearly complete. The remaining stages are started sequentially but the last stage starts before the completion of any of the previous stages. The seventh stage defines unconstrained target architectures, and the eighth involves identifying constraints. The ninth concerns constraining target architectures, the tenth with defining the IS strategy and transition plan, and the eleventh with planning framework maintenance and use.

An example of the Enterprising Modelling approach has been provided by Flaatten et. al. (1992). Although the approach is not business-centred, they suggest that understanding the organization's business plan is a necessary first step that serves to promote understanding of the value system, culture and strategies for which the IS plan is being developed. Many different tools such as Critical Success Factor analysis or Nolan's stage model can be used during this initial stage. The results of the first step then allow for identification of accepted risk and benefit criteria for project evaluation. Once the criteria have been established, Flaatten et. al. suggest that analysis of the organization's processes, data requirements, and systems be done. This analysis is expected to identify short and long-term systems projects which can then be evaluated using the chosen criteria, and ranked in priority sequence.

Other popular methodologies include Holland Systems Corp.'s PROplanner Method Guide, IBM Corp.'s Business Systems Planning approach, and Andersen Consulting's Method/1. As described by Lederer and Gardiner (1992), the Method/1 approach has five distinct objectives; to identify the organization's information needs; to find new opportunities for using information to achieve a competitive advantage; to define an overall information technology strategy for satisfying the organization's information technology objectives; to define data, application, technology, and organizational requirements for supporting the overall information technology strategy; and to define the activities needed to meet the aforementioned requirements and thereby implement the overall information technology strategy. The planning process is completed in ten work segments as follows: scope definition and organization; business and competitive assessment; present status assessment; information technology opportunities; information technology strategies; organization plan; data and applications plan; technology plan; information action plan; and project definition and planning.

A very different approach to SISP is the Organizational approach described by Earl (1993). Based upon his empirical study of the various approaches, he concluded that the Organizational approach is more effective than the other approaches. The methodology of the Organizational approach is less formal than any of the popular approaches used today, and emphasizes learning about business problems and the opportunities for contribution afforded by IT. Adopting the organizational approach could involve setting up mechanisms and responsibility structures to encourage IS-user partnerships within the organization. It may also mean developing IS planning and development capabilities by ensuring that IS managers are members of all permanent and ad hoc teams. Earl argues that the organization must strive to recognize strategic thinking as a continuous activity, identify and pursue business themes, and accept "good enough" solutions that can be built upon. Above all, Earl states that organizations using this approach should encourage any mechanism that promotes organizational learning about the scope of IT.

2.1.10 Management

SISP has long been recognized as an intricate and complex process with numerous problems that plague planners and can prevent its success (Lederer & Sethi 1992). The IS manager and team conducting the planning projects must pay careful attention to a number of specific factors in order to be successful. First and foremost, the SISP process requires a holistic or interdependent view supported by top management. Methods may be necessary but they could fail if the process factors receive no attention. It is also important to explicitly and positively incorporate implementation plans and decisions into the strategic planning cycle. Second, successful SISP seems to require users and line managers to work in partnership with the IS function (Flaatten et. al. 1992). This may not only generate relevant application ideas,

but it will tend to create ownership of both the process and outcomes. Third, SISP must be conducted efficiently by seeking to identify projects that can generate an immediate payback (Lederer & Sethi 1992). Finally, Earl (1993) adds that SISP in practice should be eclectic, selecting and trying methods and process initiatives to fit the needs of the time. One consequence of this view might be recognition and acceptance that planning need not always generate plans, and that plans may arise without a formal planning process.

Like any corporate strategic planning effort, a strategic IS plan must be long-range. Moreover, it must not be a static document, but an evolving model that effectively supports the management decision-making process on an ongoing basis (Lederer & Gardiner 1992, Atkinson & Montgomery 1990). SISP should also concentrate on those areas where information systems and related technology are truly essential. An integral component of strategic IS planning should be to regularly identify, assess, and present applicable information technologies to senior management by describing the technology and explaining its uses, technical and economic feasibility, and most likely trends (Atkinson 1991(b)). Doing this keeps the planning process ongoing and creates knowledgeable employees who are better equipped to participate in the process, thereby solidifying their commitment to the planning process and the plan itself (Laware 1991). It is important to avoid the misconception that SISP occurs only at prescribed times through a formal process. Strategic information systems planning should also occur when circumstance demand it (Atkinson 1992(a)).

2.2 BUSINESS PROCESS REENGINEERING

2.2.1 Importance

Traditionally, information technology has been employed by organizations to automate existing processes, which typically resulted in incremental productivity improvement. The reality of today's environment necessitates a more revolutionary approach, where technology is used to reshape the way work is done. Current management literature is rife with terms such as business reengineering, process innovation, and core process redesign, each promising to cure the ills plaguing modern organizations. While the amount of hype is extraordinary, the basic tenants are intuitively appealing and supported by anecdotal evidence. No matter what terms are used, the essential ideas espoused include a process orientation and the critical role of IT as an enabler of process redesign. Before discussing the role of IT in more detail, it is important to gain a better understanding of the nature of Business Process Reengineering (BPR).

2.2.2 Definition

Notable management gurus Michael Hammer and James Champy (1993) have defined reengineering in the following manner.

Reengineering is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance such as cost, quality, service, and speed.

Fundamental rethinking means asking questions about what is done and why it is done that way. It also means starting from scratch with a clean sheet as if unconstrained in order to concentrate on what 'should be'. Radical implies disregarding existing structures and procedures and abandoning the outdated rules and assumptions that underlie current ways of accomplishing work. Achieving dramatic results requires the innovative application of technology to business problems and aiming for re-invention, not improvement, enhancement or modification.

2.2.3 Processes

The true key to reengineering is thinking about IT in terms of how it can support redesigned business processes. Thomas Davenport (1993) defines a business process as "a structured, measured set of activities designed to produce a specified output for a particular customer or market." He also states that processes are what an organization does to produce value for its customer, that processes need clearly defined owners, and that processes cross organizational boundaries. What is truly amazing is that most business processes have never been measured, let alone analyzed with the capabilities of modern day IT in mind. The result of a process focus is the ability to concentrate on interdependent activities that add value to the process customer rather than on maximizing the performance of particular individuals or organizational functions.

2.2.4 Motivation

At the heart of reengineering is the idea that appurtenances of the industrial revolution, namely, the division of labour, economies of scale, and hierarchical control, do not work in today's environment where nothing is constant or predictable (Hammer & Champy 1993). While proponents such as Hammer have argued that organizations must reengineer in order to survive, others advise caution given the risks associated with such radical change. Even Hammer (1990) has admitted that "Reengineering cannot be planned meticulously and accomplished in small and cautious steps. It's an all-or-nothing proposition with an uncertain result." Top management commitment is absolutely essential, yet not sufficient, as change of this magnitude can not be simply willed. Further, management usually underestimates both the time and resources required to complete a project. Thomas Stewart (1993) believes there are two principle motives for reengineering, fear and greed, and he recommends not doing it unless absolutely necessary.

2.2.5 Approaches

Even given these criticisms, the possibilities presented by BPR are so appealing that organizations are continuing to pursue countless reengineering efforts. Advocates of reengineering have studied successful projects in an attempt to extrapolate common themes so as to present a methodology for reengineering. Approaches presented by various authors have begun to coalesce, and agreement about the steps to be followed has been forming. The main components of this methodology and its associated techniques are presented next.

In his seminal Harvard Business Review article, Hammer (1990) identified what he termed "Principles of Reengineering". More recently, Hammer and Champy (1993) expanded upon these principles in reference to "Recurring Themes" of BPR. The central principles or themes are that work should be organized around outcomes instead of tasks, and that those who use the output should be the ones performing the steps of the process and making the control decisions. Organizing work in this manner generally results in combining several jobs into one with the aim of reducing non-value added management overhead. Additional tenants include capturing information only once and at the source, linking parallel activities instead of integrating their results, and treating geographically dispersed resources as though they were centralized. While these ideas describe the results of a reengineered business process, they do not demonstrate how these ends are to be achieved.

2.2.6 Methodology

Realizing the lack of a standard methodology, some companies have developed their own approaches to reengineering. One well known example is the seven-step methodology deployed

by AT&T called "Process Quality Management and Improvement" (I/S Analyzer 1993). The seven steps are as follows:

1. Establish process management responsibilities
2. Define process and identify customer requirements
3. Define and establish measures
4. Assess conformance to customer requirements
5. Investigate process to identify improvement opportunities
6. Rank improvement opportunities and set objectives
7. Improve process quality

A somewhat more comprehensive six-stage model has been developed by Guha, Kettinger and Teng (1993). Their model includes the following:

1. Envisioning new processes
 - Securing commitment from senior management
 - Identifying reengineering opportunities
 - Identifying enabling technologies
 - Aligning with corporate strategy
2. Initiating change
 - Organizing the reengineering team
 - Setting performance goals
3. Diagnosing the processes to be reengineered
 - Documenting the existing process
 - Uncovering pathologies
4. The redesign stage
 - Exploring alternative designs
 - Designing new processes
 - Designing the human resources architecture
 - Prototyping
5. Reconstructing the process
 - Installing IT
 - Reorganizing
6. Monitoring the newly constructed processes
 - Performance measurement
 - Links to quality improvement

In his recent book "Process Innovation", Thomas Davenport (1993) recommends a five step framework with ten key activities within this change process framework. Davenport's approach includes the following.

Steps:

1. Identifying processes for innovation
2. Identifying change levers
3. Developing process visions
4. Understanding existing processes
5. Designing and phototyping the new process

Activities:

1. Identifying and selecting processes for redesign
2. Identifying enablers for new process design
3. Defining business strategy and process vision
4. Understanding the structure and flow of the current process
5. Measuring the performance of the current process
6. Designing the new process
7. Phototyping the new process
8. Implementing and 'operationalizing' the process and associated systems
9. Communicating ongoing results of the effort, and
10. Building commitment toward the solution at each step

2.2.7 Management

Each of these approaches shares many common elements, some of which are not explicit in the aforementioned steps. Reengineering must be driven from the top down into the organization, starting with a process redesign team composed of high-level managers from across the organization. A clear, strategic vision must be developed and continually communicated to guide and sustain the effort. The establishment of bench marks and quantifiable productivity improvement goals in the areas of time, cost, and quality are essential to measuring gains. Fundamental to the success of any approach is the recognition that redesign must start from a clean slate and not be bound by existing concepts of organization or process design. The above

methodologies not only require a rethinking of existing structures and procedures, but also a reevaluation of the organizational philosophy. Once the redesign is completed, the organization must continue to fine tune the rejuvenated processes through a program of continuous improvement. This also means that the information technology infrastructure should be standardized yet flexible enough to accommodate future changes.

3. CASE STUDY

3.1 INTRODUCTION

3.1.1 Project Objectives

The purpose of this project is to assess the information systems (IS) needs of the Canadian Cancer Society (CCS), B.C. and Yukon Division. A periodic review of information requirements (IR) and IS is necessary in order to ascertain the implications of recent environmental and organizational changes, to identify any unfulfilled needs, to determine the level of satisfaction amongst IS users, and to evaluate new opportunities provided by technological advancements. Such an assessment would normally be done in the context of Strategic Information Systems Planning (SISP). Under a traditional SISP approach, existing systems are studied, problems are identified, alternate solutions are analyzed, and recommendations for change are made. Essentially, the focus is on how IS can be used to support what the organization does. Recent thinking suggests that to do IS planning properly, the whole organization must be examined in terms of its business processes and their outcomes. Moreover, information technology (IT) is seen as enabling organizations to not only do the things they do better, but more importantly, to do things in ways never before considered. The central tenants of this new approach, commonly referred to as Business Process Reengineering (BPR), were used in conjunction with the more traditional SISP methods during the project.

3.1.2 Overall Approach

The project was completed in three phases. The first phase entailed a review of the academic and professional literature on the subjects of SISP and BPR. Both sets of literature emphasize the need to take a broad organizational view by developing an understanding of

existing objectives, structure and challenges. The goal of the second phase of the project was to document these aspects of the B.C. and Yukon Division. The information for this phase was gathered primarily via interviews with administrators and staff in the Division and District offices, and complimented by examining existing documents. The literature also suggests that to do SISP or BPR properly requires the full time commitment of a cross-functional team for a period of months or even years. Given the time and resources available for the project and future planning efforts, it was clear that a significantly scaled down approach would be necessary. The aim of the third phase, therefore, was to capture the essence of SISP and BPR in an approach that can be easily used by the Division to develop a long-range IS plan. An organizational overview and the recommend planning approach are presented in this report.

3.1.3 Terminology

Before proceeding with a description of how the report is organized, it is appropriate to define what is meant by some of the terminology used. Information systems (IS) can be used to refer to any systematic means of transforming raw data into useable information, which may or may not involve computers. IS can also include all organizational resources and practices that support this transformation. For purposes of this report, IS will be used in a more limited sense, referring specifically to the hardware (architecture) and software (applications) used by the Division. While information technology (IT) is occasionally used to refer to the more technical aspects of IS, both terms will be used interchangeably in this document. Information requirements (IR) refers to the basic blocks of information that the organization needs in order to achieve its objectives and carry out its plans. An end-user is someone who either interacts directly with office systems or utilizes output from the systems, and is not part of the data processing or computer services department. Finally, personal computer (PC) will be used here

to refer to a micro-processor based computer that is compatible with the IBM standard. These definitions are intended to be consistent with the popular use of the terms, and should provide a common language for the readers of this document.

3.1.4 Report Layout

The remainder of this report is composed of three principle parts, an Organizational Overview, the recommended IS Planning Approach, and Future Considerations. The main sections making up the Organizational Overview are Mission & Priorities, Structure & Supporting Systems, Challenges, and Overview Summary. The IS Planning Approach part includes major sections on Guiding Principles, Sample Analysis, Organizational Implications, and Planning Summary. The Future Considerations part then reviews the project by presenting some additional thoughts. Included in the main appendices are a listing of the Program & District Objectives, an Organization Chart & Committee Overlay, detailed summaries of the Division Office Systems, the Data Processing Philosophy, a portion of the Equipment Acquisition Policy, Background for IS Challenges, and a brief review of relevant Client-Server Computing literature.

3.2 ORGANIZATIONAL OVERVIEW

3.2.1 Mission & Priorities

The Canadian Cancer Society (CCS), B.C. and Yukon Division, is a not-for-profit, non-government organization dedicated to the prevention, research and treatment of cancer. Its mission statement is as follows:

The Canadian Cancer Society is a national, community-based organization of volunteers, whose mission is the eradication of cancer and the enhancement of the quality of life of people living with cancer.

The head office is located in Vancouver where approximately two thirds of the sixty to seventy permanent staff members are engaged in policy setting, program development, and administration. The remaining staff work out of one of the Division's six District offices in support of the thousands of active volunteers in the more than one hundred Unit offices. It is these volunteers who are responsible for fundraising and the delivery of CCS programs in their communities.

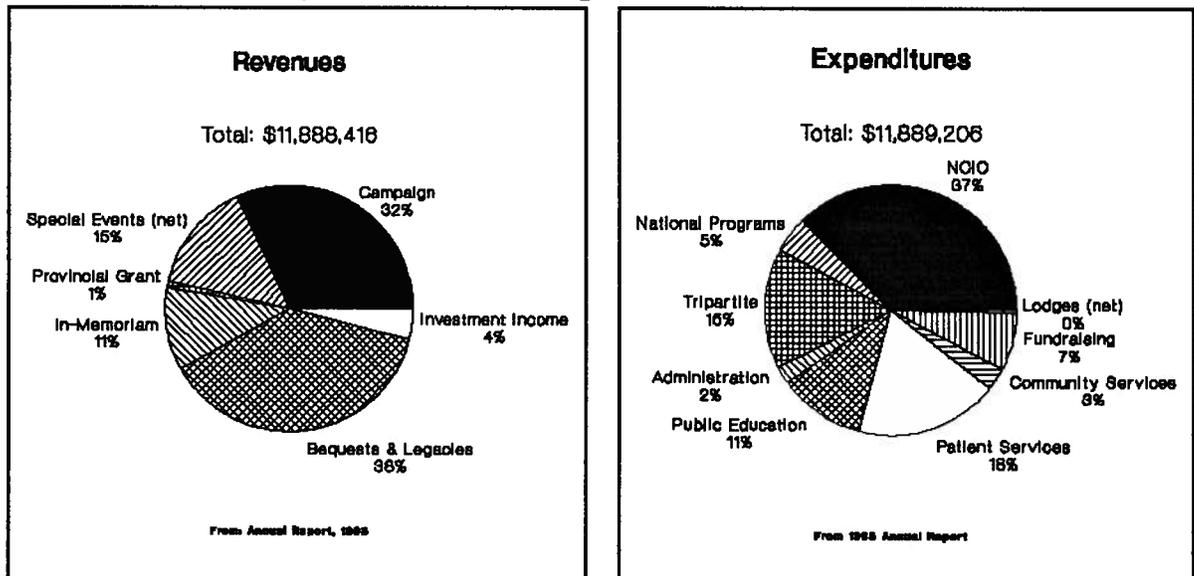
The Division has established long range priorities to the year 2000. These priorities are to continue:

1. To meet the changing needs of cancer patients and their families for physical, financial, and emotional support.
2. To promote tobacco-free communities.
3. To support programs to significantly reduce mortality from breast cancer.
4. To maintain a strong volunteer force.
5. To value staff and volunteers equally.

Up until 1982, the Division did not set objectives because it was believed that failure to achieve these goals would be detrimental to volunteer motivation. By 1984, objectives for fundraising were regularly established, yet as little as four or five years ago evaluation was still not considered appropriate. Today, objectives have become an annual focus with monitoring occurring from the Unit level up. The most recent objectives for each of the Division's primary functional areas and the six Districts are detailed in Appendix A.

The B.C. and Yukon Division has grown over the past 12 years from a \$4 million per year organization, to one that generates nearly \$12 million in net revenue. The sources of these funds are the annual campaign, special events, bequests and legacies, in-memoriam donations, investment income, and a provincial government grant. After taking account of the various fundraising and administrative expenses, funds are allocated to research commitments and to the various programs of the Division. Research funds are apportioned to the National Cancer Institute of Canada, the research arm of the CCS, and National Programs based upon a revenue assessment formula. In addition, through a 1990 tripartite agreement, the Division also serves as the fundraising body for the B.C. Cancer Agency, which operates cancer treatment centres throughout the province, and the B.C. Cancer Foundation that runs the B.C. Cancer Research Centre. The purpose of this agreement was to avoid public confusion over multiple solicitations, and to provide financial stability for the Foundation and Agency. A summary of revenues and expenditures by source for the most recent fiscal year is shown in Figure 1.

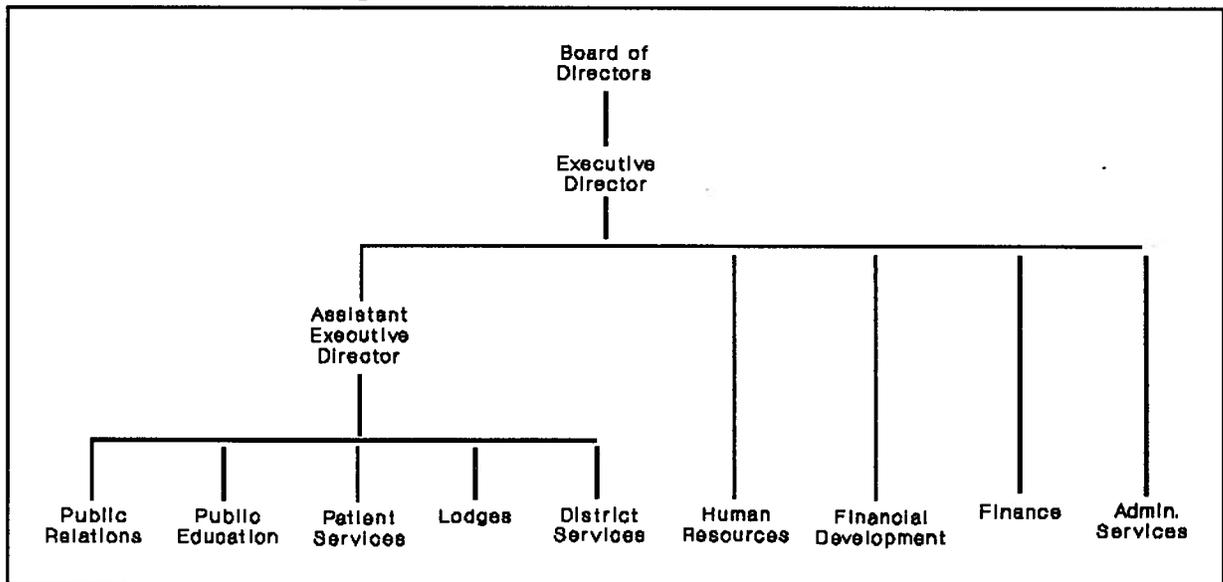
Figure 1: Summary of Revenues & Expenditures



3.2.2 Structure & Supporting Systems

A portion of the organizational structure is shown in Figure 2, and a detailed organization chart and committee overlay are provided in Appendix B. The primary decision makers for the B.C. and Yukon Division are the Board of Directors Members, Executive Officers, Committee Chairs and District Presidents. The staffing structure at the Division's head office includes Administrators and staff for each of the main programs, a Comptroller who is responsible for Accounting and Computer Services staff, a Director of Administrative Services who oversees office support staff as well as Material and facilities management, and the Manager of Human Resources who coordinates staffing. The staffing structure at the District level consists of a District Manager, Program Coordinators and District Assistants. The Division office departments, along with District and Unit offices are described below in terms of their responsibilities and major supporting IS applications. A more detailed description of the Division office systems can be found in Appendix C.

Figure 2: Partial Organization Chart



3.2.2.1 Financial Development

The Financial Development department is responsible for overseeing the Division's fundraising activities. This encompasses the Residential Campaign where efforts are made to contact every household either personally or by mail, the Corporate Campaign during which both businesses and employee groups are solicited, special events such as Jail-N-Bail, and appeals to special interest groups. Another major source of revenue is planned charitable giving in the form of bequests and legacies, and in-memoriam donations. Financial Development's Administrator and staff interact with the fundraising committees to set priorities and establish budgets using a bottom up approach. The department is supported by a custom designed Master Donor Accounting System (MDAS) that provides access to some seven hundred thousand individual donor records, and a relatively new Bequests system that identifies potential planned giving donors. These systems are used to refine campaign targets and marketing procedures.

3.2.2.2 Patient Services

Patient Services, in conjunction with various volunteer committees, is charged with the development of childhood and family programs, the coordination of emotional support programs, and the provision of financial assistance to needy cancer patients. Some of the department's programs include Camp Goodtimes for children with cancer, Ogoogo Teen Ski Camp, Family Camp, Look Good Feel Better, Reach to Recovery, Living with Cancer, and Volunteer Drivers. Eligibility for financial aid is assessed based on such factors as income and number of dependents. The department uses a custom designed application to record and maintain electronic records on patients who have received financial aid. It also uses an additional program to maintain records of volunteers, councillors and campers who participating in Camp

Goodtimes. These electronic records are in addition to the paper files maintained by the department.

3.2.2.3 Lodges

The CCS currently operates two lodges, the Vancouver Lodge, in operation since 1980, and the Vancouver Island Lodge, which opened in 1982. Both lodges are situated close to B.C.'s two cancer treatment centers, in Vancouver and Victoria, from which patients are referred. The primary function of the lodges is to provide a comfortable and convenient place to stay for cancer patients while receiving treatment, but they are also used to host various support group meetings. Plans are under way for a new lodge to accompany the future opening of a treatment center in Kelowna. A custom designed program is used by Vancouver Lodge staff to collect patient demographics, calculate bill amounts and identify room vacancies. The system provides statistics on the number of patients and spouse or escort stays, where residents are from, and the type of cancer being treated.

3.2.2.4 Public Education

The role of Public Education is to get the residents of B.C. and the Yukon to practice cancer prevention, and to recognize the importance of early detection. In working with the various associated committees, Public Education staff provide the materials and training to support unit volunteers in the delivery of the programs in the community. The principal programs produced by Public Education focus on reducing tobacco use, sun protection, healthy food choices, and breast health. A custom designed application is used to track an inventory of videos used by staff and volunteers. The department also maintains records on materials use, as well as demographics and statistics that facilitate program evaluation. In addition to the

community programs, the Cancer Information Line with its supporting on-line database allows volunteers to respond quickly and effectively to information requests. Based upon the nature of these requests, the department can evaluate the effects of its programs as well identify emerging trends in public interest.

3.2.2.5 Public Relations

The challenge of maintaining an image that accurately reflects the CCS in the eyes of the community falls upon the Public Relations Administrator, staff and committee. The department is responsible for media liaison, for developing the language for the materials used by the other departments, and for fostering awareness of the services provided by and the role of the CCS in supporting cancer research. Public Relations is also concerned with carefully nurturing connections between volunteers and staff across the various programs of the CCS without infringing upon the equally important identification of individuals with a particular service program. The department's communication tools include the Annual Report, along with two bi-annual publications, the Pacific Report and the Cancer Research News. These publications are distributed to major donors, businesses, District offices and other organizations such as the B.C. Cancer Agency.

3.2.2.6 Human Resources

The Human Resources Manager is the sole person involved with all personnel related activities at both the Division and District levels. The screening of job applicants, orientation of new employees, maintenance of employee records, development of compensation packages and employee handbooks are all functions performed by the Manager. All employee records are

currently kept in paper files, therefore, generating statistics or performing analysis on such things as turnover or absenteeism are done manually.

3.2.2.7 Administrative Services

Administrative Services is essentially responsible for general office management. Materiel management, purchasing, and facilities management are under the administrative umbrella, as is providing support for the Board of Directors and executives, and the management of issues related to estate bequests. The department currently uses two separate custom designed software applications. The first is the Bequests / Planned Giving program that is shared with Financial Development, and used to maintain information pertaining to estate management. The second program is the Inventory Control & Order Entry system, which serves to track inventory levels and the dispersement of materials to District offices. The Inventory Control system is seen as the means by which tight inventory control can be realized.

3.2.2.8 Financial Services

Included under the Finance umbrella are both the Accounting and Computer Services functions. The Accounting side is discussed here, while Computer Services, which operates relatively autonomously, is described in the next section. The Comptroller, Accounting Manager, staff and committee volunteers are responsible for the detailed tracking of revenues and expenditures, which are reflected in the financial reports. Both monthly and quarterly financial statements are distributed to program Administrators, District Managers and District Presidents. The Finance department also plays a large role in the budgeting process, but this role is changing as Districts and Unit offices become increasingly involved. The accounting and budgeting processes are supported by a custom designed General Ledger package that

consolidates information from the MDAS, Accounts Payable, Patient Services, and Inventory Control systems. An Accounts Payable application is used by Finance personnel to manage and pay vendor invoices.

3.2.2.9 Computer Services

The role of Computer Services includes the planning, development, enhancement and maintenance of information systems in the Division. The Manager has overall responsibility and serves as the liaison with the National and other Provincial offices on IS issues. The Systems Operator, similar to the Manager, is involved in most daily activities, and is also currently responsible for the Jail-N-Bail application. A Systems Analyst examines the MDAS database using statistical techniques to help improve the effectiveness of the direct mail campaign. There are two permanent Data Entry Operators who input donor information into the MDAS database, supplemented by additional contract personnel during busy periods. Augmenting the Division office staff are the designated District users that receive yearly training and act as the support persons for their respective offices. IS planning still follows the spirit of the Data Processing Philosophy developed in 1984 (see Appendix D). Information needs are assessed via questionnaires and informational interviews with users. The most significant applications supported by Computer Services have been custom designed in-house to run on an IBM AS/400 system, with programming provided by outside consultants.

3.2.2.10 District Services

The primary role of District Services is to support the District staff who in turn support the Unit volunteers. An important component of this role is volunteer development, which entails the recruitment of skilled people and the provision of training so that they are equipped

to deliver programs in the community. District Services must be able to accommodate the changing needs of volunteers and provide them with the tools and resources they require to be effective. The recruitment, supervision and evaluation of all District staff is also the responsibility of District Services. Further, the Administrator acts as a liaison between the Division office and District / Unit staff, councils, executive and management committees. Another function performed by District Services staff is the monitoring of District and Unit expenses, along with the preparation of reimbursements to expense accounts. Currently much of this work is performed entirely manually, with only the end results being entered into the accounting system.

3.2.2.11 District Offices

Officially there are six districts, namely Vancouver Island, Kootenay, Greater Vancouver, Interior, Fraser Valley, and the North. In many respects, due the size of the population it covers, the Vancouver City unit is treated as a seventh District. Theoretically, the role of district managers and staff is to provide the motivation and tools for volunteers to deliver programs, but in actuality staff are also involved in delivery. Coordination responsibilities for the various programs are divided amongst the District Manager and Program Coordinators based upon individual strengths and preferences. The District Assistants and volunteers perform all of the office management tasks. The District offices act as information conduits passing along program materials from the Division office to the Units, and collecting revenue receipts and expense documentation to be sent to Division for accounting. There exists considerable variability in the staff size of the districts, from the Kootenays with one and three quarters personnel to the Greater Vancouver Region with eight permanent staff. At the District level, PCs with the office recommended Enable software and other popular packages are used for

common tasks like word processing, spread sheeting and database applications. At the present time, there are no electronic links between the Division and District offices.

3.2.2.12 Unit Offices

Unit offices are completely volunteer based, and are directly responsible for fundraising and the delivery of CCS programs in their communities. Units cover mutually exclusive geographical areas that encompass all of B.C. and the Yukon, and each unit falls under the direction of a District Office. All units operate under the principle that expenses should not exceed 5% of revenues, which practically means that not all units will have actual physical offices. The size and sophistication of the various units differs considerably, with only the largest offices having faxes or personal computers. A special equipment task force has recently developed a policy statement for the acquisition of equipment by Unit offices, which in part states that they are expected to provide for their own support. Therefore, unit offices are currently free to use any software they feel appropriate to meet their needs. A portion of the task force report is reproduced in Appendix E.

3.2.3 Challenges

Every organization faces challenges in today's constantly changing world. General environmental trends such as the aging of the population, increased ethnic diversity, and desires for specialized treatment and recognition on the part of both people with cancer and volunteers, all have significant effects on the way in which the CCS operates. In order to get the 'biggest bang for the buck', the organization must be closely scrutinized in terms of the distribution of decision making, allocation of responsibilities, communication of information, and assessment of goal achievement. Advancements in IT provide new means for the Division to respond to

environmental changes and improve its business processes, however, IS present their own set of challenges (background material related to the IS challenges is provided in Appendix F). The ability of the Division to effectively continue to pursue its mission is dependent upon its reaction to these challenges.

3.2.3.1 Environmental Changes

A pivotal environmental change that is just developing is the planned decentralization or regionalization of health care by the provincial Ministry of Health. The plan calls for the establishment of regional health boards and community health councils. It will be some time before the effects of regionalization can be determined, but there are questions regarding future charity grants and potential attachments on spending. There may also be a need to have CCS volunteers become members of these regional and community boards in order to better represent the Society's interests.

Another environmental concern is the increased competition for both fundraising dollars and for volunteers. This change is the result of several factors including an overall rise in number of charities, an increased number of general cancer related charities, and the growth of so called 'boutique' organizations that focus on specific types of cancer. Each organization has vested interests, and they are beginning to polarize around these interests. A related change is in the nature of volunteer commitment. Traditionally, volunteers have had long-term associations with the organizations of their choice, but increasingly volunteers are more episodic in their commitment and are bringing with them new skills and aspirations. This trend will impact both leadership and governance at the CCS.

3.2.3.2 Organizational Issues

In adjusting to these environmental changes, the Division must be concerned with attending to internal issues that may enable it to become more effective and efficient. One issue that has arisen is that of the decision making process within the Division. Many newer charitable organizations empower their staff to make operational decisions, which results in quick response times. The traditionally conservative nature of the CCS has led to a more consensual decision making process that may put the Division at a disadvantage in competing for limited financial and human resources. A related issue is that of the degree of centralization or decentralization of decision making. Decentralization can often lead to faster and perhaps more efficient decisions, but the effectiveness is dependent upon the maturity of the decision making body. Determining where decisions should be made can be difficult considering the differing levels of maturity of districts and units across the organization.

An ongoing concern is maintaining a balance between the number of staff and the number of volunteers. If the staff size is too large then volunteers do not have meaningful work, and this is a key motivation for many volunteers who are fulfilling a personal need that can not be achieved elsewhere. As well, if the staff size is too small then there is a risk of either staff or volunteers leaving after they become frustrated with an insufficient support structure. Ensuring an optimal balance can be particularly demanding considering that the number of volunteers ranges from a low of a few thousand during the summer to as many ten or fifteen thousand during the spring campaign.

Another key issue that is a concern for any organization is information collection and dissemination. Raw revenue and expense data, along with information requests, generally travel

the same route, from Unit to District to Division, and then after processing, from Division, to District to Unit. The timeliness of the returned information can be less than ideal, and since there are only six districts but over a hundred units, the potential for bottlenecks at the district level is high. Moreover, general unit meetings occur only once each month, which further complicates the task of information dissemination. Keeping such a large volunteer work force up-to-date and satisfied with the operational and program information they receive presents a critical challenge for the Division.

A final issue that is receiving increased attention is planning and evaluation. Being a charitable organization, the CCS is driven by the results of the research it supports and the programs it provides. However, being a non-profit organization does not mean that long-range planning and bottom-line sensitivity are not important. Given limited resources, the organization must weight the benefits of a diversity of programs and fundraising activities against the need to focus energy on areas where significant contributions can be made. Improvement in this area requires input from both staff and volunteers at all levels of the Division, along with adequate planning processes and information feedback for rational decision making.

3.2.3.3 IS Issues

Like all modern organizations, the benefits afforded by IS are becoming increasingly important to the CCS in performing both daily activities and accomplishing long-term objectives. The Division is in the early stages of a fundamental transition from a time when the need or demand for personal computers was small to a point where they will become an embedded and essential component of the organization's information infrastructure. The introduction of significant numbers of PCs into the Division raises many new issues for managing the resulting

end-user community. As well, the combination of AS/400 and PCs greatly increases the complexity of IS planning and decision making in regard to application management. The development of a vision for the future through a formal planning exercise, and the establishment of pertinent end-user computing policies may be needed to help smooth the transition.

Another significant IS challenge, one faced by most organizations, is the relationship between the data processing staff and the rest of the Division. The Computer Services personnel interact with a wide range of users. Many people will have had previous computer experience and with prompting will adeptly express their IS needs. Some users, on the other hand, may form exceedingly high expectations fuelled by media hype, others will give little thought to the possible uses of IS in their area, and still others may simply be unable to articulate their needs. The correct identification of information requirements is paramount to successful deployment of IS, yet the diversity of user knowledge and consideration of IS potential makes this task extremely difficult. Overcoming this hurdle requires a commitment to user education and the development of mechanisms to facilitate communication between Computer Services and the Division's user groups.

An IS issue that is associated with many of the broader organizational issues is that of the degree of centralization or decentralization of IS resources. There is a trade-off between central control for integration and security benefits and user group, particularly District and Unit, needs for ready access to computing facilities. The pace of technological advancement makes purely economic arguments based on various implementation schemes unsuitable for resolving the debate. Moreover, the basic question is one of control, which is a political issue that is not necessarily grounded in rational economic thought. Generally, the centralization or

decentralization of computing should correspond with prevailing organizational norms. The Division is currently highly decentralized in carrying out organizational activities, yet more centralized in terms of decision making. This incongruence makes it difficult to distribute the supporting IS resources in a manner that appears sensible to all parties.

3.2.4 Overview Summary

The mission and organization of the Division clearly illustrate what the CCS is all about, namely, raising funds for cancer research, providing services to cancer patients and educating the public about cancer. The distinguishing aspect of the current structure is the arrangement of organizational responsibility in terms of a Division, District and Unit offices. The Division office has specialized functional departments and acts as the coordinating body, while the Districts and Units directly interact with the communities. The majority of the staff and IS resources are devoted to the Division office, while the volunteers in the Unit offices and the support they receive from District staff are unquestionably essential to the success of the organization. The Division has enjoyed significant growth over the past decade, but like all organizations faces certain challenges that if unattended have the potential to reduce productivity.

The face of regional health care is changing and competition for funds and volunteers is increasing. To remain effective the Division must use planning and evaluation to ensure that tasks are completed and decisions are made by the right people, and that they have the information they need to make rational choices. Information systems will play an important role, yet the deployment of IT raises new issues that must also be dealt with. Planning, communication and education are essential tools for smoothing the transition to a more complex

IS environment, maintaining a solid relationship between IS providers and users, and allocating IS resources where they are needed most.

3.3 IS PLANNING APPROACH

3.3.1 Guiding Principles

The goal here is not to recommend the implementation of specific technologies or applications, but rather to present an approach along with some supporting techniques that can be used by the Division to develop an Information Systems Plan. The approach represents a simplified amalgamation of many different popular Strategic Information Systems Planning (SISP) methodologies, supplemented with important Business Process Reengineering (BPR) ideas (in-depth reviews of SISP & BPR literature are provided in the Literature Review). This is certainly not the only approach that could be used, however, it should provide a sound basis for future planning efforts. Developing the actual IS plan requires the participation of players who are intimately familiar with the current business processes and systems, and should be done in conjunction with general organizational planning.

The thrust of the approach is the identification of key organizational objectives and information requirements, which guide the selection of appropriate information architectures and applications. The sample analysis that is shown in the next section serves to demonstrate this approach, but is not intended to be complete. The level of examination is necessarily high, and based only upon the researcher's knowledge of the Division. Again, the detailed analysis that demands negotiation amongst the organization's IS stakeholders in order to generate commitment to conclusions is best done in the context of future planning efforts. Following the sample analysis is a discussion of the resulting organizational implications. The directions generated

from the analysis are examined in terms of their resolution potential for the various challenges identified during the organizational overview.

3.3.2 Sample Analysis

Many of the SISP methods recommend analyzing the organization by comparing different dimensions or aspects, and this is the technique that is employed here. Simple two dimensional matrices or tables facilitate such an analysis by visually representing the relationship between distinct facets of the organization. The examination of more complex relationships can also be done by looking at two or more tables concurrently. A well defined table provides an easily read and succinct summary of ideas resulting from the comparison that are often not well articulated in purely narrative descriptions. Moreover, the process of decomposing the organization along a number of dimensions and examining the resulting relationships often serves to bring discrepancies in how different people view the organization to the surface. The real power of this dimensional analysis is in stimulating discussion amongst informed organizational members.

In keeping with SISP and BPR approaches, the sample analysis done here has a top-down orientation. The analysis starts by identifying key organizational objectives. These objectives are then explored further in terms of the involvement of the various organizational departments or units in achieving those aims. This is followed by the generation of broad classes of information requirements that are important to the operation of the Division. These information classes are then examined in relation to both objectives and organizational units. These three aspects of the Division, in conjunction with knowledge of existing systems, will permit the determination of gaps between information needs and the current levels of IS support.

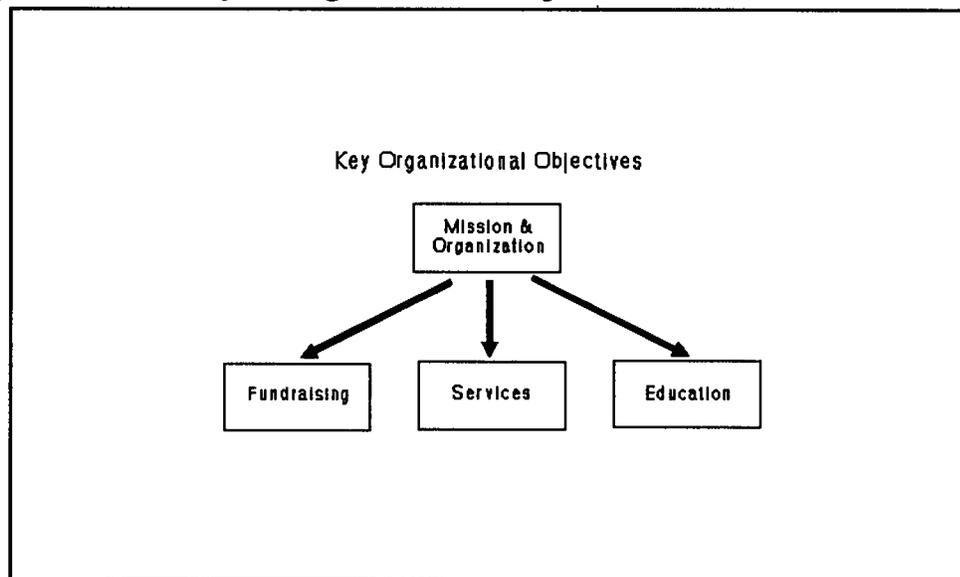
Knowledge of these differences furnishes a basis for developing criteria for the selection of future applications and information architectures, and establishing priorities for subsequent planning endeavors.

3.3.2.1 Objectives & Organization

The CCS mission is stated as the "eradication of cancer and the enhancement of the quality of life of people living with cancer." The mission, along with the functional organization of the Division, serves to suggest three key organizational objectives. These are listed below and summarized in Figure 3.

- To raise funds for cancer research and support programs.
- To provide programs and services that offer help and hope to cancer patients.
- To encourage people to take personal responsibility through education.

Figure 3: Summary of Organizational Objectives



Clearly, fundraising, patient services and education are all driving forces for the CCS and the Division. Fundraising, however, accounts for nearly all revenue generated, and thus is a

prerequisite for the provision of programs and the pursuit of education. The essential role that fundraising plays is reflected in the existing IS infrastructure of the Division.

As a "community-based organization", volunteers are critical to the achievement of the CCS mission and objectives. To be effective, volunteers must be properly supported by staff at the Division and District offices. A measure of this support is the level of direct involvement of various organizational units in achieving the key objectives. A sample evaluation using the objectives identified above, the organizational units described in the Organizational Overview, and a three level scale is shown below in Table 1.

Table 1: Organizational Unit Involvement in Objective Achievement

Organizational Units	Organizational Objectives		
	Fundraising	Services	Education
Public Relations (PR)	Medium	Medium	High
Public Education (PE)	Low	Low	High
Patient Services (PS)	Low	High	Low
Lodges (L)	Low	High	Low
District Services (DS)	Medium	Medium	Medium
Financial Development (FD)	High	Low	Low
Human Resources (HR)	Low	Low	Low
Finance (F)	Low	Low	Low
Administrative Services (AS)	Low	Low	Low
Computer Services (CS)	Low	Low	Low
District Offices (DO)	High	High	High
Unit Offices (DO)	High	High	High

For this table to serve its purpose as a communication tool, it is important to understand the rationale used to determine individual ratings. Essentially, each rating represents the relative level of involvement of an organizational unit in achieving a particular objective. For example, Public Relations was considered to have a Medium level of involvement in Fundraising. The reasoning behind this rating is two fold. First, PR through such activities as developing the language to be used in campaign materials is certainly more involved than Human Resources or Finance. Second, although PR does play a role, it is clearly not as involved as Financial Development. Therefore, for each objective some organizational units are highly involved, others have some involvement, and others have little direct involvement. A more precise scale could be used, but, for purposes of this analysis three levels was deemed sufficient.

The true benefit of such an analysis is the trend or impact information that can be obtained. The table indicates that both the District and Unit offices play crucial roles in the pursuit of all three organizational objectives. Public Relations and District Services are also shown to have broad and significant influence in objective achievement. Public Education, Patient Services, Lodges, and Financial Development are critical to a particular objective, but have minimal involvement in realizing other objectives. The remaining organizational units are of course essential to the operation of the Division, but their influence on objective achievement is indirect and based upon the support they provide to the other units.

3.3.2.2 Information Requirements

Identifying key objectives, whether they be formal or informal, serves to highlight what is important to the Division. Organizational objectives are critical in that they provide a context within which to conduct IS planning, but that alone is not enough. One must also determine the

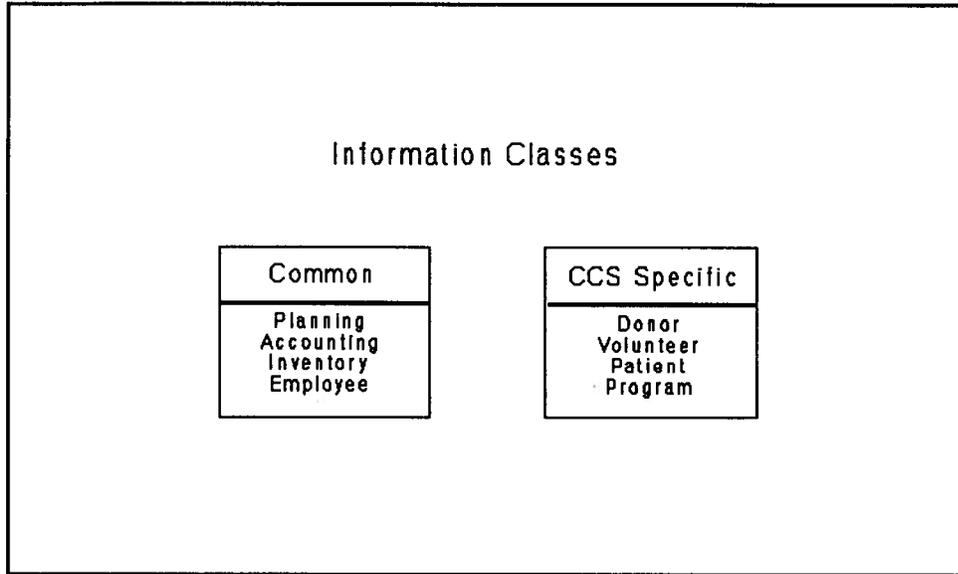
information that is required by the various organizational units in order for them to achieve these objectives. Once information requirements are determined, steps can be taken to assess current systems, and to evaluate additional opportunities for the deployment of IT. Knowing the importance of information requirements in terms of objectives also facilitates the development of priorities for system maintenance and development projects.

For purposes of this analysis, information requirements have been grouped into general information classes. These classes represent information needs related to both common organizational requirements and those needs that are specific to the CCS. Each of these classes is listed below, along with a brief description of what is meant by each. The groupings are summarized in Figure 4.

Table 2: Description of Information Classes

Information Class	Description
Common	
Planning	Business plans, objectives and strategies, along with the resulting budgets for the period.
Accounting	Summary and detailed revenue and expense information by source.
Inventory	Inventory on hand (supplies, materials, etc.), and amounts dispersed to organizational units.
Employee	Employee data and related policy information.
CCS Specific	
Donor	Individual donor contact data and history.
Volunteer	Individual volunteer contact data, and program or committee association information.
Patient	Individual patient contact data, and program information or history where appropriate.
Program	Information specific to fundraising and program development or delivery, but not covered by other information classes.

Figure 4: Common & Specific Information Classes



The importance of each of these information classes to objective achievement is assessed in Table 3 using a three level scale.

Table 3: Importance of Information Class to Objective Achievement

Information Class	Organizational Objectives		
	Fundraising	Services	Education
Planning Information	High	Medium	High
Accounting Information	Medium	Low	Low
Inventory Information	Medium	Medium	Medium
Employee Information	Low	Low	Low
Donor Information	High	Low	Low
Volunteer Information	High	High	High
Patient Information	Low	High	Low
Program Information	Medium	Medium	Medium

Once again the individual ratings are relative rankings of the importance of information classes to the achievement of a particular objective. In other words, in terms of Fundraising, Planning, Donor, and Volunteer information are key. Accounting, Inventory and other Program specific information are also important, while Employee and Patient information are of little significance. Just to remind the reader, these ratings are the researcher's interpretation of the situation, and may differ somewhat from those that would be reached through a more involved discussion of a larger group. Individual differences in ratings, however, are less important than the communication that should be brought about by critical examination of these aspects of the operation of the Division.

A number of observations can be made from the table. Volunteer and Planning information are shown to be essential to accomplishing the key organizational objectives. This would seem intuitive given that planning is a prerequisite to achieving goals, and that volunteers are the Division's key resource. The table also indicates that Inventory and Program specific information are relatively important in all three objective areas, while the remaining classes of information are only influential for an individual objective. Another interesting observation is that there seems to be a difference in the overall number and importance of information to objective achievement. Fundraising appears as the most information intensive, followed by Services, with Education having the least information needs. This result may partially be a reflection of the relative importance of each objective to the Division as a whole.

In addition to determining the relative importance of information classes, it is also necessary to establish where the information is created and subsequently used. Table 4 below provides this picture.

Table 4: Creation and Use of Information by Organizational Unit

Info. Class	Organizational Unit											
	PR	PE	PS	L	DS	FD	HR	F	AS	CS	DO	UO
Planning	B	B	B	B	B	B	B	B	B	B	B	B
Accounting	B	B	B	B	B	B	B	B	B	B	B	B
Inventory	U	U	U	U	U	U	U	U	B	U	U	U
Employee							B					
Donor	U					B					B	B
Volunteer	B	B	B	B	B	B		B			B	B
Patient	U		B	B							B	B
Program	B	B	B	B	B	B					U	U

Note: C = Create, U = Use, B = Both

The interpretation of this table is different and perhaps somewhat more difficult than the previous ones. There are four possible entries for each cell, namely, Create, Use, Both, or blank. A Create entry indicates that the organizational unit is somehow actively involved in producing information in this class, which may include being simply the source of the information or the organizer of the data for use by other units. A Use entry merely signifies that the respective organizational unit utilizes information in this class, whether receiving this information from other units, or storing and using it internally. The Both entry means that the unit both creates and uses the information from the class, while a blank entry indicates that the unit is neither involved in the creation of information for this class, nor a user of the information. The table does not provide an indication of extent, level, or importance of the information classes to each organizational unit.

In looking at the table it is clear that all organizational units are involved in creating, using, or both creating and using, Planning, Accounting, and Inventory information. The remaining common information class, Employee, is shown to only be of interest to Human Resources. The CCS specific classes related to Donor, Volunteer, Patient and Program information are naturally created and used predominately by the organizational units most directly involved in achieving the corresponding organizational objectives. While Donor and Patient information are created and used by a small number of units, Volunteer and Program information are required by most line units. As well, the table shows that the District and Unit offices are both major sources and users of organizational information with involvement in all classes except Employee information.

3.3.2.3 IS Infrastructure

Determining objectives and assessing the organization in terms of information needs are necessary steps that provide a basis for examining the existing IS of the Division. The goal is not to look for problems or to suggest minor changes to current applications, but rather to identify areas where future resources should be devoted. This requires that existing applications be documented in terms of how they provide information and support organizational units in the pursuit of the key objectives. The focus here is on applications or software and not on hardware. Once links between information needs and IS support are known, plans for future IS applications can be made, which will then suggest appropriate supporting architectures.

Each of the existing significant custom designed or customized package applications identified during the organizational overview is listed in Table 5 beside the information class that it is most closely associated with. One note to be made from the table is that there are currently

no custom applications devoted primarily to processing Planning or Employee classes of information. This should not be surprising for Employee information since it is of little direct importance in objective achievement (see Table 3), and used essentially by only Human Resources (see Table 4). Planning information, on the other hand, is created and used by all organizational units, and is essential to achieving the key objectives. Some of the other applications such as the GL or MDAS do provide information for use in Planning, but additional software that can assist the Division in this area may be worth investigating.

Table 5: Existing Custom Applications in each Information Class

Info. Class	Existing Custom Designed IS Applications
Planning	
Accounting	General Ledger, Accounts Payable
Inventory	Inventory & Order Entry
Employee	
Donor	Master Donor Accounting System, Bequests / Planned Giving
Volunteer	Volunteer Registry
Patient	Patient Services, Lodge Registry
Program	Camp Goodtimes, Video Loans, Cancer Information Line

The level of support provided by each of the custom applications in terms of organizational objectives is analyzed in Table 6 below. The ratings represent a relative ranking of Low, Medium or High for the applications on an objective by objective basis. For example, the MDAS application has a High rating for Fundraising, while the General Ledger, which is valuable for Fundraising but to a lesser degree, received a Medium rating. The table indicates that with the exception of the Cancer Information Line, all custom applications only provide significant support for one key objective. The table also suggests that Fundraising has the

largest amount of custom application support, followed by Services, with Education receiving the least support. This may be related to possible differences in information intensity (as suggested in Table 3), or to the relative importance of each objective to the operation of the Division.

Table 6: Custom Application Support for Organizational Objectives

Custom Applications	Organizational Objectives		
	Fundraising	Services	Education
General Ledger	Medium	Low	Low
MDAS	High	Low	Low
Patient Services	Low	Medium	Low
Accounts Payable	Low	Low	Low
Inventory & Order Entry	Low	Low	Low
Bequests / Planned Giving	High	Low	Low
Camp Goodtimes	Low	Medium	Low
Video Loans	Low	Low	Medium
Volunteer Registry	Medium	Low	Low
Cancer Information Line	Low	High	Medium
Lodge Registry	Low	Medium	Low

The relationship between organizational units and the supporting custom applications is summarized in Table 7. In the table, a P means that the application was primarily designed for use by the corresponding organizational unit, while an S indicates that the application provides secondary support to another unit. For instance, MDAS's main function is to track donor information for use by Financial Development. At the same time, it furnishes the General Ledger with revenue information that is used by Finance. The table clearly shows that Finance receives support from the greatest number of custom applications. A number of other

organizational units also enjoy the benefits of custom application, yet a surprising number currently have no direct support.

Table 7: Custom Application Support for Organizational Units

Custom Applications	Organizational Unit											
	P R	P E	P S	L	D S	F D	H R	F	A S	C S	D O	U O
General Ledger								P				
MDAS						P		S				
Patient Services			P					S				
Accounts Payable								P				
Inventory & Order Entry								S	P			
Bequests / Planned Giving						P		S	S			
Camp Goodtimes			P									
Video Loans		P										
Volunteer Registry											P	
Cancer Information Line		P										
Lodge Registry				P				S				

Note: P = primary unit supported, S = secondary unit supported

The analysis of applications to this point has focused on custom designed and customized software, however, there are many non-customized packages being used throughout the Division. In fact, the District and Unit offices are supported almost entirely by this type of software, and the Division office has just recently invested heavily in PCs for the purpose of running such applications. The majority of the applications currently in use are personal productivity tools that are standard in most office environments. There are numerous more specialized software applications on the market, but few, if any, of these are currently being used. The applications utilized in the Division are categorized into a number of generic areas in Table 8.

Table 8: Existing Packaged Applications in each Application Category

Application Category	Existing Packaged Applications
Word Processing	WordPerfect (DOS & Windows), Enable, Microsoft Works
Spread Sheeting	Enable
Database	Enable, IDDU, Query
Graphics / Presentation	WordPerfect
Desktop Publishing	First Publisher, Aldus Pagemaker, Correl Draw, WordPerfect
Communication	AS/400 Email & Calendar, PC Support

From this point on, the application category names will be used instead of the brand names of the actual software because the generic functionality is more important and stable than the actual package used. Each of the categories, the typical uses associated with software of this type, and an example specific to the Division is described in Table 9.

Table 9: Typical Uses for Software in each Application Category

Application Category	Typical Use
Word Processing	Producing documents for written correspondence. <i>Example:</i> Preparing a memo to all District Presidents.
Spread Sheeting	Performing numeric calculations, and developing models for sensitivity analysis. <i>Example:</i> Analyzing changes to budget forecasts.
Database	Storing and manipulating large amounts of data. <i>Example:</i> Retrieving the names of all persons donating more than \$200.
Graphics / Presentation	Creating visual aids for documents or presentations. <i>Example:</i> Using a pie chart to show a revenue breakdown by source.
Desktop Publishing	Producing documents suitable for an external audience. <i>Example:</i> Creating a direct mail letter for potential donors.
Communication	Accessing remote data, and transferring information. <i>Example:</i> Querying the MDAS from a District or Unit office.

It is important to note at this point that the information classes defined earlier (see Table 2) generally represent requirements related to information that needs to be captured, processed, stored, and later retrieved. These types of requirements are best handled by database applications. It should come as no surprise then that virtually all of the existing custom designed applications are fundamentally database oriented. These customized applications have been built with specific requirements and departmental needs in mind, which makes it relatively easy to determine the organizational units supported and to assess the contribution toward objective achievement. The same can not be said for the standard application categories, which by their generic nature complicates the analysis. Nevertheless, the effort is made here, starting with Table 10 that examines the level of support for organizational objectives.

Table 10: Packaged Application Support for Organizational Objectives

Application Category	Organizational Objectives		
	Fundraising	Services	Education
Word Processing	Low	Low	Low
Spread Sheeting	Low	Low	Low
Databases	Low	Low	Low
Graphics / Presentation	Low	Low	Low
Desktop Publishing	Low	Low	Low
Communication	Low	Low	Low

These ratings, in keeping with the previous tables, are relative rankings of the level of support provided by the various application categories for each objective. Clearly, these applications are valuable tools, yet the table indicates that they are for the most part not providing direct support for organizational objectives. It is important to keep in mind that these

ratings are meant to reflect the current situation, and not necessarily the potential level of support in the future. Moreover, the benefits provided by these tools is very rarely easily identifiable or measurable. It is somewhat easier to identify how the different application categories support organizational units, and this is shown in Table 11.

Table 11: Packaged Application Support for Organizational Units

Application Category	Organizational Unit											
	P R	P E	P S	L	D S	F D	H R	F	A S	C S	D O	U O
Word Processing	X	X	X	X	X	X	X	X	X	X	X	X
Spread Sheeting								X			X	
Databases											X	
Graphics / Presentation											X	
Desktop Publishing	X					X					X	
Communication	X	X	X		X	X	X	X	X	X		

Note: X denotes use by organizational unit

In Table 11, X signifies that the organizational unit currently uses a package in the associated category. Something that is not represented is the degree or level of usage. The table shows that Word Processing and Communication (primarily email) applications are widely used, while most other application categories are used by only two or three organizational units. This should not be completely unexpected given that word processing and email are essential tools in most office environments. The table also demonstrates that the District Offices use the greatest variety of packaged applications. This result can be at least partially by explained by the fact that District offices are physically separate, thereby, requiring their own dedicated resources.

3.3.2.4 Analysis Discussion

Although it would be easy to use generalities drawn from individual tables to make suggestions about future resource allocations, decisions of that nature should be based on the complete analysis. Moreover, the sample analysis presented here has been done at a very high level, and clearly more detailed study is warranted. Although individually the sample tables present only a superficial look at the relationships between aspects of the Division, together they do highlight a number of points that deserve further investigation. The most significant of these are introduced below, with a more complete discussion of the issues included under the Organizational Implications section.

One important observation that comes out of the analysis is that while the District and Unit offices play important roles in objective achievement (see Table 1) and are key users of many classes of information (see Table 4), they do not have direct access to the large corporate databases (see Table 7). They do receive accounting reports from Division office and can request any additional information they require, but this form of dissemination is less convenient and timely. The issue here is larger than just the costs and benefits of providing a communications link. The real question concerns the distribution of organizational resources and information. Recent technological advancements make distributive or cooperative computing increasingly favorable for many organizations. The Division should consider the potential benefits, particularly intangibles such as increased job satisfaction, that it may achieve from moving in this direction.

Another interesting result of the sample analysis is that while the Planning and Volunteer information classes are extremely important for objective achievement (see Table 3) and used

by the majority of organizational units (see Table 4), there are no directly supporting custom applications (see Table 5). A related observation is that the existing custom applications tend to support a single objective (see Table 6) and only one or two organizational units (see Table 7). Applications related to either Planning or Volunteer information classes have very high impact potential. Realizing this potential would require a more involved planning effort in order to satisfy the information needs of such a large number of organizational units pursuing what are moderately diverse objectives. The ability of the Division to explore this potential opportunity would require further investigation as part of a formal planning project.

A final issue that can be drawn from the analysis tables is that even though the Division is relatively small in terms of staff size, has fairly clear objectives, and basic information needs, the supporting information architecture is comparatively complex. In addition to Division office's numerous custom databases (see Table 5), there are many packaged applications (see Table 8) that are used by staff and volunteers in offices throughout the Division (see Table 11). Keeping these systems operating smoothly demands not only constant attention from a well-trained staff, but also considerable thought devoted to management issues. The Computer Services department must be responsible for providing the information architecture, however, trained and motivated end-users can be extremely productive on their own. The Division should look to continue to ensure that its end-user environment stimulates the productive use of resources and skills by developing and communicating policies that provide clear guidance.

3.3.3 Organizational Implications

There are a number of parallels between the IS issues identified during the organizational overview and the results of the preliminary analysis. The IS challenges suggested a need for

planning, communication and education to strengthen the relationship with end-users, aid in the management of an IS environment that includes PCs, and deal with resource allocation issues. Similarly, the sample analysis implies that a formal planning process could be used to explore the benefits of distributed computing, to exploit the high impact potential of systems providing general planning and volunteer information, and to develop policies that give end-users greater control and responsibility. The implications of the linkages between the IS challenges and the analysis outcomes are described next in terms of planning priorities for the Division. This is followed by a brief discussion of the possible application of some reengineering principles.

3.3.3.1 Planning Priorities

As has been mentioned before, traditional IS planning is a long process that requires the participation of a number of organizational players. While the work undertaken for this project is in no way comprehensive, it does serve to suggest priorities for future planning efforts. The first priority would be to develop a new or update the existing Data Processing Philosophy so that it reflects current organizational objectives and strategies. A related priority should be the development of a vision statement and guiding principles that will provide a framework within which to select applications and architectures that accommodate organizational constraints. These aspects of an IS plan are the basis for the more specific planning components related to policy, personnel, and technology. Priorities in each of these areas are discussed next.

A prominent policy issue for the Division is that of the appropriate distribution of IS resources amongst organizational offices, that is, Division, District and Unit. While arguments for centralization or decentralization can be made based on economic analysis, underlying issues of control and decision making power are key determinants in resource allocation. There must

be agreement as to the importance of the activities performed at each level, and this should be reflected in the IS resources devoted to the respective offices. As suggested in the planning literature, achieving congruence between responsibility and IS resource distribution would be aided by clearly specifying decision making authority for each of the three levels. For example, it maybe agreed that Division office will establish standards for hardware and software, and that Districts and Units can make their own purchases as long as they adhere to these standards. Even though some of these aspects of control have already have been worked out, continued negotiation between organizational groups and formally spelling out the results may help maintain a high level of commitment.

A related policy matter concerns the management of end-user computing (EUC). Three primary activities or attributes of EUC management discussed in the literature are direction, support and control. Direction involves setting policies that clarify acceptable practices for end-users, and planning the allocation of resources based upon established goals. Support is concerned with the provision of tools and training that enhance the continued development and growth of EUC. Control imposes appropriate accountability through evaluation mechanisms that ensure that EUC activities are performed effectively, efficiently, and in compliance with policies. The benefits of EUC can include quicker turnaround, more customized and specific responses, and happier, more productive end-users. The potential risks are increased security exposure, duplication of effort, incompatibility, inefficient programming and improper documentation for end-user developed applications. The Division should ensure that it continues to synchronize its management strategy with the stage of EUC development, so that the changing needs of the end-user community are satisfied.

A priority related to personnel is ensuring that adequate IS skills exist within the Division. IS literature suggests that there are two aspects that deserve attention, skills within Computer Services, and skills of the end-users. Supporting the new end-user community and exploring new IS opportunities requires that personnel within Computer Services have detailed knowledge of the hardware and software that users have today and may expect to have a need for in the future. Any skills that may currently be missing can be acquired either by training existing staff or hiring new staff with the appropriate abilities. In addition, end-users should have the knowledge necessary to use not only the systems currently available to them, but also the generic skills that will allow them to conceive of new applications or uses for existing products. Insufficient attention to personnel planning has been cited by many organizations as a major pitfall to the effective use of IS resources, so it is important for the Division to address this issue. The key points here are that the role of Computer Services shifts increasingly toward support, and both Computer Services and end-users become more proactive in seeking applications for IT.

In terms of technology, there are a number of factors that suggest that the Division should consider an eventual move toward an organization wide client-server environment (Appendix G describes client-server computing in more detail). Foremost among these is that a need exists to share information amongst geographically dispersed offices. In particular, much of the information within the Division needs to be consolidated and is efficiently stored at the Division office, yet it also needs to be broken down and distributed to District and Unit offices. Considerable communication of information between offices is also necessary for the effective operation of the Division. As well, the existing systems in the Division include both personnel productivity tools running on PCs, and large database applications residing on the AS/400.

These factors demonstrate a need for the capabilities that client-server computing can provide. While much of the hardware base exists, a transition to a true client-server environment would be a long and arduous process. The move would have to be made in deliberate small steps, and this requires a long range vision that is supported by a detailed migration plan.

3.3.3.2 Reengineering Potential

The planning approach presented in this report predominately adheres to the traditional SISP methods with some components of BPR thinking added where appropriate. Such an approach serves as the core means of incremental adaptation to change, however, this should be supplemented with projects aimed at achieving more substantial jumps in productivity. While continuous improvement is essential, remaining competitive in the long-run requires the implementation of more innovative change initiatives. The principles of BPR provide guidance for engaging in projects with this goal. Fundamentally, reengineering is about redesigning processes from scratch, challenging long held assumptions, and forging links across organizational boundaries. A summary of prominent BPR literature can be found in the Literature Review, and some suggestions regarding initiating projects within the Division are presented below.

As a first project, it is advisable to select a process that will allow the development of reengineering skills, has the potential for a quick pay-off, and has little risk of failure. Typical indicators of a process ripe for redesign are where large amounts of paper are passed between a number of people, and the turnaround time is an order of magnitude greater than the total actual processing time. The selection of a process is an important step that should be done by the redesign team, but an example is useful for illustrating the type of thinking that reengineering

entails. Lets say the process of 'paying the bills' is examined. This includes current activities like expense reimbursement and accounts payable. Some radical questions that could be asked include: are reimbursement forms needed; what is their purpose; can all data entry be done at the source; should all bills be directly mailed to the Division office; can a computer system completely automate the reimbursement and payment activities; what are the costs and benefits of the process. These questions are meant only to demonstrate that no question is off limits, and that real innovation is the result of creative thinking.

Experience and small successes in reengineering undertakings provide the momentum necessary to tackle a project with the expectation of more dramatic productivity improvements. An obvious prospect for the Division is the process of communicating information between Division, District and Unit offices. Currently there are huge amounts of information passed downward through a combination of mailings, faxes, and telephone calls. Clearly, the communication capabilities of IT offer abundant opportunities for the formation of a more efficient and effective process. Achieving results in such an endeavour demands the participation of a large number of people over a significant amount of time, but the potential benefits can make the effort worthwhile.

3.3.4 Planning Summary

This section of the report presented a simplified IS planning approach that is based upon traditional SISP and more recent BPR methodologies. Drawing upon the background material garnered during the organizational overview, key objectives, information requirements and the existing IS infrastructure were analyzed in a series of evaluation tables. The importance of District and Unit offices, the possibilities for the deployment IT to satisfy Planning and

Volunteer information requirements, and the complexity of the Division's IS environment all suggested certain directions for future planning efforts. These observations were then looked at in terms of broader organizational implications and the links with the challenges identified as part of the overview. This facilitated the establishment of planning priorities related to distribution of IS resources, management of end-user computing, maintaining the IS skill base, and investigating client-server computing. Finally, some additional thoughts on reengineering for innovation through a project approach were introduced.

3.4 FUTURE CONSIDERATIONS

The Division has enjoyed considerable success over the last few years, and information systems have played a significant role in supporting organizational units as they pursue key objectives. The purpose of this project was to assess the IS needs of staff and volunteers to help ensure that the Division continues to be an effective users of IT. While the Division is well positioned for the future, changes in the environment and the desire to improve operations compel the search for ways to exploit new opportunities afforded by IT advances. In recognition of the inherent linkages between the organization as a whole and IS as a strategic resource, the project started with an organizational overview followed by the development of an IS planning approach.

The analysis suggested a number of specific priorities for a formal planning exercise, including building upon existing policies for the end-user community, investigating client-server computing, and continuing to manage the resource allocation issue. However, more important is the generic planning process itself because it can be used again-and-again during each planning cycle. The ultimate value of the project is in presenting ideas and hopefully motivating people

to act upon these. Changes in behaviour or thinking have the potential for far greater impact than the implementation of any specific recommendation. The project has been about IS, and clearly IT is a fundamental organizational resource, but it is important to keep in mind that it is not a cure-all. The creative application of IS can bring about dramatic improvements in organizational performance, but this is dependent upon the skill and motivation of the Division's staff and volunteers.

4. THEORY

4.1 INTEGRATION OF SISP & BPR

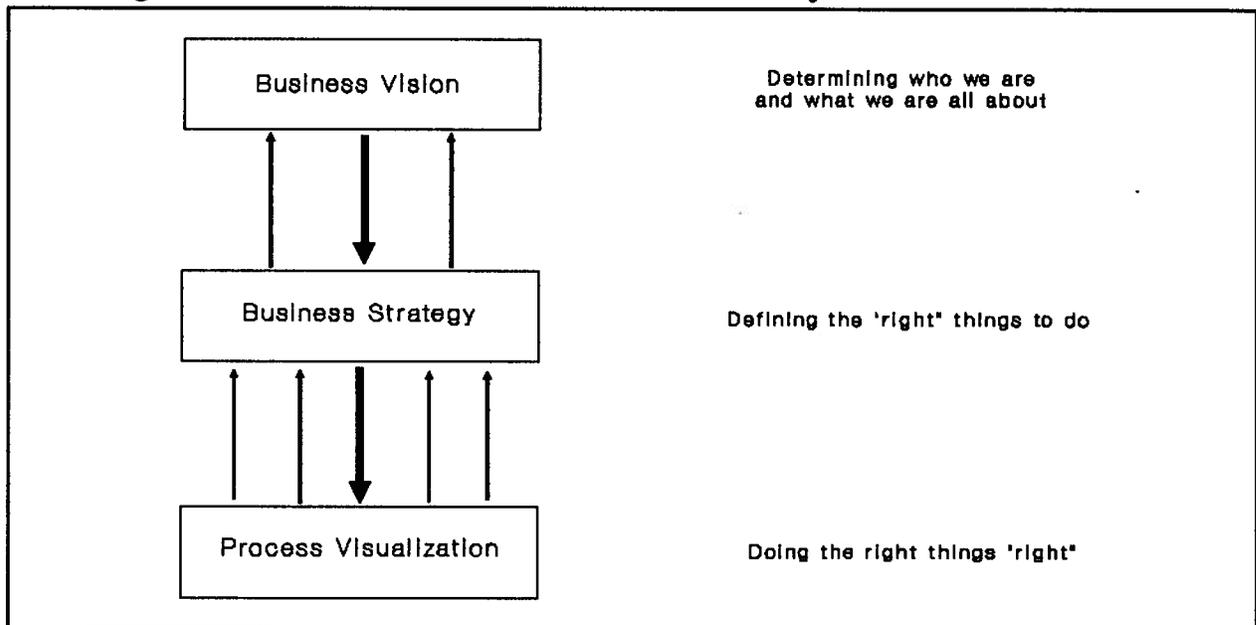
As was demonstrated in the literature review, both SISP and BPR represent useful approaches for an organization seeking to exploit the performance improvement opportunities offered by information technology. Currently, the bodies of literature around these two approaches have remained unconnected, and questions about the possibility of integrating notions from each have not been addressed. This section is devoted to constructing an integrated approach based upon existing SISP and BPR methodologies. This is accomplished in a series of logical steps, beginning with the development of a model designed to illustrate how SISP and BPR impact the various aspects of an organization. This is followed by an analysis of the assumptions, emphasis, strengths and weaknesses of the different SISP approaches and the BPR approach. Based upon the model and the analysis, key principles are selected from each of the SISP approaches and BPR so as to benefit from the advantages of each. These principles are then expanded into a comprehensive approach which will be referred to as Organizational Information Systems Planning (OISP).

4.1.1 Base Models

A prerequisite to combining the SISP and BPR approaches is an understanding of the essence or central tenets of each. One way to begin to acquire this knowledge is to examine SISP and BPR in terms of a simple organizational model. To be of use, the model must be capable of graphically depicting the relationships between fundamental organizational aspects, so that the effects of SISP and BPR on these linkages can be discerned. A model that satisfies these requirements was not found in the existing SISP or BPR literature. However, the Process

Visualization Hierarchy introduced by Barrett (1994), and the Business System Diamond developed by Hammer (1993) provide a basis for the creation of an appropriate model. Although a number of well researched models, such as Leavitt's (1965) Factors in Organization Change framework, could have been drawn from Organizational Theory literature, these base models were deemed sufficient for the intended purpose. The Hierarchy and the Diamond were originally constructed as an aid to understanding BPR, but their qualities are sufficiently general for use with SISP. Barrett's Hierarchy is shown in Figure 5 and Hammers' Diamond in Figure 6, and both are described in more detail below.

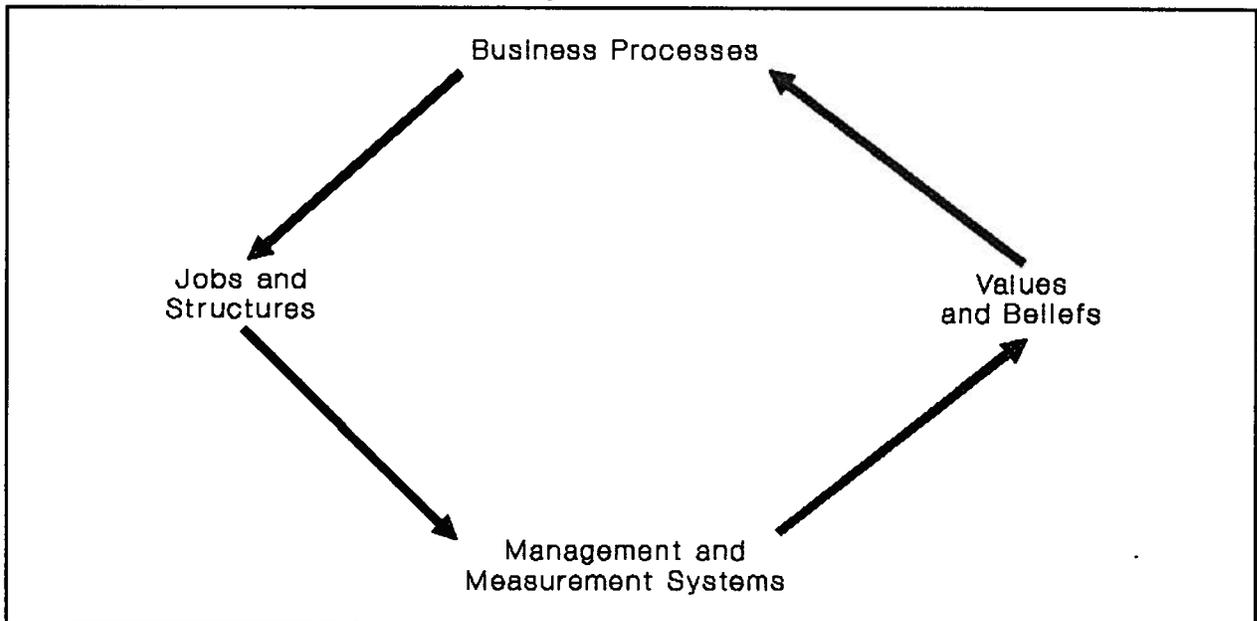
Figure 5: Barrett's Process Visualization Hierarchy



The goal of the Process Visualization Hierarchy is to demonstrate the differences between business vision, business strategy and process visualization. Barrett defines business vision as a statement of an organization's fundamental goals and values that provide a high-level sense of direction. He summarizes business strategy as being about understanding markets and customers such that resources can be allocated to taking advantage of opportunities. Finally, he defines

process visualization as the development of a mental picture of a future reengineered business process in advance of its realization. Barrett believes that business vision and business strategy set the proper context for process visualization development, which he sees as the key to BPR. He also feels that much confusion has arisen from a tendency in BPR projects to homogenize these elements together or to use them interchangeably. He argues that while all three elements are interdependent, they must remain separate and distinct.

Figure 6: Hammer's Business System Diamond



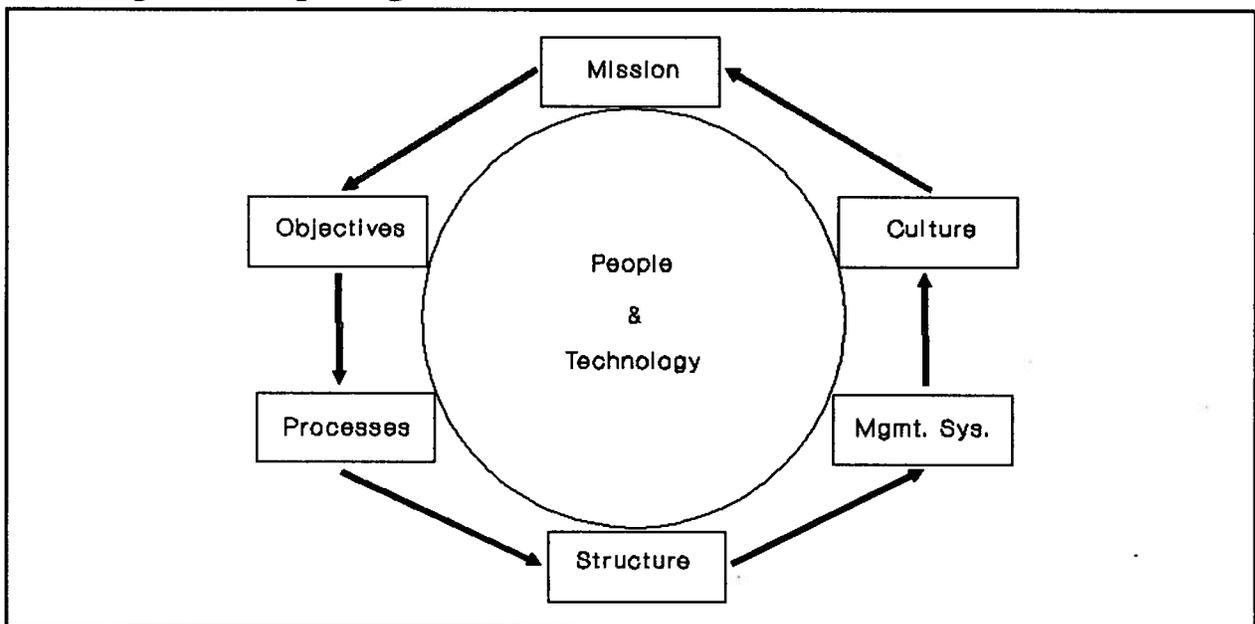
Hammer's Business System Diamond is intended to depict the changes that occur when an organization reengineers its business processes. The linkages between organizational aspects are the key to understanding how the modification of business processes in turn changes jobs and structures, management and measurement systems, and values and beliefs. As an example, Hammer points out that integrating a process often gives rise to multidimensional jobs that are best accomplished by teams. Team members must be evaluated and paid by means of appropriate management systems, which shape employees' values and beliefs about what is

important. These values and beliefs then support the newly integrated process, thereby completing the diamond. Hammer argues that reengineering requires that all four of these highly interrelated aspects be redesigned concurrently in order to ensure congruency.

4.1.2 Organizational Model

Clearly, processes is the common factor in Barrett's Hierarchy and Hammer's Diamond, one that can be used to merge these frameworks into a more comprehensive organizational model. A model that combines Barrett's and Hammer's work along with some additional basic ideas is shown in Figure 7.

Figure 7: Simple Organizational Model



As a discussion aid, the organizational aspects in the boxes around the outside of the model will be referred to as components, while the aspects in the middle will be called elements. All components are derived directly from Barrett and Hammer with the arrows between them symbolizing the primary direction of influence. The Mission and Objectives component labels

are more generic terms that correspond to Barrett's Business Vision and Business Strategy. Similarly, the remaining component terms are simplified replacements for those used by either Barrett or Hammer. The elements in the center, People and Technology, were added by the researcher to represent how integrating aspects not only bind an organization together, but also allow components to influence one another indirectly. For example, a very strong cooperative culture or the use of self-monitoring statistical controls as is done in Total Quality Management programs would facilitate the redesign of a process into parallel activities to be performed by work teams. An important concept represented in the model is that Processes is just one component of an organization that is both shaped by upstream components and has a determining influence on downstream components. A brief description of what is meant by each of the components and elements in the model is provided below in Table 12.

Table 12: Description of Organizational Components & Elements

Aspect	Description
Mission	The vision for the organization that determines what the organization is all about thereby providing direction and guidance.
Objectives	The strategy that is within the context of the mission and specifies what things the organization does to fulfil its mission.
Processes	The sequenced collections of activities that through certain methods use resources to convert inputs into outputs to meet the objectives.
Structure	The organization of tasks and responsibilities into jobs and units that determines who does each activity in a process.
Mgmt. Systems	The management, measurement and evaluation systems that ensure that jobs are done and how well objectives are met.
Culture	The values and beliefs that reflect congruence between the other organizational components.
People	The human capital of the organization that supports the organizational components.
Technology	The application of scientific and industrial advances to organizational components.

The people and technology elements of an organization are not only of central importance but also may be subject to more frequent changes than the organizational components. Hiring the right people, and adopting the newest technology have long been accepted as means of improving organizational performance. Recognizing the potential competitive gains to be made from modernizing organizational components has also led to mission statement recasting, strategic objective adjustments, structural modifications, the adoption of new management styles and evaluation systems, and cultural recreations. It could be argued that initiatives aimed solely at components downstream of Processes will meet with only limited success because most organizations have not yet redesigned their long outdated processes, and therefore can not expect to benefit from merely altering downstream components. After all, organizing people into teams and changing the way they are paid is of little value if the process they work on remains sequential and highly fragmented.

Most classic SISP approaches implicitly accept the organizational components as they are, and simply seek to replace the existing technologies with more efficient IT. Supplanting typewriters with word processors and other forms of office automation illustrate this thinking. Changes in any of the organizational components are of course reflected in subsequent IS plans, but often there is no direct connection between these events. BPR, on the other hand, tightly couples modification of the Processes organizational component with the enabling ability of modern IT. A process reengineering project has downstream implications for the Structure, Management Systems, and Culture components of the organization, and provides the necessary information for the development of a long-range IS plan. An example is IBM Credit's redesign of its financing process using a new computer system that allows a single generalist to replace a group of specialists (Hammer & Champy 1993). Some modern SISP approaches, like the

Organizational approach described by Earl (1993), may involve the alteration of any individual organizational component or combination of components along with IT considerations in order to form future IS plans.

4.1.3 Analysis of SISP & BPR

Based on the above interpretation of the organizational effects of classic SISP, BPR and modern SISP, IS planning in the context of BPR can be viewed as a unique form of modern SISP. The literature also suggests a number of important similarities between SISP and BPR. They both aim to pursue a long-range vision that has strategic implications for the organization. Top management commitment, continual communication and education are prerequisites to success, and both rely on cross-functional teams following a chosen methodology. There are, however, some easily identifiable differences. The BPR approach places more emphasis upfront on IT capabilities, focuses on customer-centric performance measures, takes a process orientation, and is accomplished via a series of discrete projects. Although the various SISP approaches have important differences, overall they tend to consider IT at a later stage in the planning process, have traditionally been internally focused, adopt a functional orientation, and are done on an ongoing basis. A key distinction between individual SISP approaches is that the classic methodologies entail an evaluation of the whole organization, while many modern methods allow IS plans to flow out of projects that have a much narrower scope.

Each type of SISP approach inherently has certain strengths and weaknesses, as does BPR methodology. Based on Earl's (1993) taxonomy and the methodology suggested by Hammer and Champy (1993), the five SISP approaches and BPR are summarized in Table 13, while the most significant strengths and weaknesses of each are shown in Table 14.

Table 13: Summary of SISP and BPR approaches

Approach	Underpinning Assumption	Emphasis of Approach
Business-Led	Business plans and needs should drive IS plans.	Business leads IS and not vice-versa.
Method-Driven	IS strategies will be enhanced by use of a formal SISP method.	Selection of the best method.
Administrative	SISP should follow and conform with the firm's management planning and control procedures.	Identification and allocation of IS resources to meet agreed user group needs.
Technological	SISP is an exercise in business and information modelling.	Production of models and blueprints.
Organizational	SISP is a continuous decision-making activity shared by the business and IS.	Organizational learning about business problems and opportunities and the IT contribution.
BPR	Business processes are outdated and grossly inefficient.	Redesigning business process with IT as the primary enabler.

Note: SISP approaches adapted from Earl (1993), BPR from Hammer & Champy (1993)

Table 14: Strengths and Weaknesses of SISP and BRP approaches

Approach	Strengths	Weaknesses
Business-Led	Business first. Raises IS status.	Ad hoc method. Depends on quality of business strategy.
Method-Driven	Provides a methodology. Plugs strategy gaps.	Lacks user involvement. Too influenced by method.
Administrative	System viability. Encourages user input.	Non-strategic. Resource constrained.
Technological	Rigor. Focus on infrastructure.	Lacks management support. Only partial implementation.
Organizational	Emphasis on implementation. Promotes IS-user relationship.	Generation of new themes. Fuzzy or soft methodology.
BPR	Large productivity potential. Performance results focus.	Creates resistance to change. High risk of failure.

Note: SISP approaches adapted from Earl (1993), BPR from Hammer & Champy (1993)

4.1.4 The OISP Approach

Now that the effects of SISP and BPR on an organization, and the assumptions, emphasis, strengths and weaknesses of the various approaches have been identified, the process of devising a new composite approach can begin. A practical technique for creating a viable approach is to purposefully extract complementary principles from each of the existing SISP and BPR approaches such that when combined, their strengths will have been captured and their weaknesses offset. An effective method of choosing principles is to attempt to achieve a balance between the method, process, and implementation concerns described by Earl (1993) as essential ingredients for successful IS planning. Having a clear methodology and supporting modelling tools ensures that method difficulties are avoided. The combination of education, objective appreciation, user input and process orientation will help sustain the planning process through to implementation. The principles selected for inclusion in OISP are listed in Table 15, and examples of these principles in practice are given in Table 16.

Table 15: Principles Selected from SISP & BPR approaches

Approach	Principle
Business-Led	An understanding of organizational objectives facilitates the development of a vision and the establishment of performance goals for the planning process.
Method-Driven	A formal methodology will provide planning teams with clear and proven means of pursuing established goals.
Administrative	Capturing user input is a good way to generate new ideas and solidify commitment to the planning process.
Technological	Choosing appropriate modelling techniques to meet needs as they arise can save planning teams the effort required to create their own analysis tools.
Organizational	Promoting organizational learning about IT will help prepare everyone for active participation in the planning process.
BPR	Adopting a customer-centred process view will aid in selecting areas where IS planning attention can be of the greatest benefit.

Table 16: Examples of Principles in Practice

Approach	Principle
Business-Led	A major organizational objective of superior customer service could be translated into a vision of becoming the industry leader in that area by achieving 9 out of 10 on performance ratings from customer satisfaction surveys.
Method-Driven	Adopting Davenport's methodology for process innovation would provide a team with 10 key activities to perform in order to complete the project.
Administrative	People who perform a process on a daily basis are likely to have many ideas for improvements that would help them in their work.
Technological	A project team may choose a CASE tool to model a portion of a redesigned process, and use this model to generate code for a new supporting application.
Organizational	A specialist on a process redesign team who has learned of the capabilities of expert systems may realize the potential of having a generalist take care of all but the most complex cases.
BPR	A financing request that requires only 2 hours of processing time, but has a customer turn around time of 14 days would clearly be an area where a customer service organization would want to improve.

Having selected key principles from the SISP and BPR approaches is an important step but they must now be amalgamated into a coherent package. The Organizational approach has been found to be very successful (Earl 1994), so it is a reasonable place to begin. Essentially, the Organizational approach is about IT education. Similarly, the Business-Led approach is about objective education. A combined education program would create an environment where the organization would always be prepared for IS planning activities. Being prepared is essential, but the organization also needs to direct its efforts. Redesigning processes as suggested by BPR, and capturing users' ideas as is done in the Administrative approach represent useful means for identifying areas where a prepared organization can apply its knowledge. Along with the appropriate knowledge and direction, the organization needs

methods and tools to help it work efficiently. The methodologies of the Method-Driven approach and BPR, along with the modelling techniques and analysis tools used in the Technological approach, would clearly be invaluable in this regard.

Two key features of OISP which emerge from the above discussion are environment and projects. The environment includes the support mechanisms that provide the necessary basis for IS planning, while projects provide the means by which the actual activity of planning can be carried out. These two aspects are summarized in Table 17, and described below in detail.

Table 17: Summary of the OISP Approach

Aspect	Underpinning Assumption	Emphasis of Aspect
Environment	A basic understanding of IT capabilities is essential to its application in achieving organizational objectives.	Continual education of top management and key users to prepare them for participation in project teams.
Projects	The best way to conceptualize how to use IT to tackle organizational challenges is in the context of multi-disciplinary teams.	To ensure that IT is given consideration so that IS initiatives may emerge from projects dealing with any organizational challenge.

Working from the Organizational and Business-Led principles, the task of establishing an OISP environment entails ensuring that everyone has a fundamental understanding of organizational objectives, and knowledge of modern IT capabilities. Two groups that are common to many planning methodologies and essential to such an environment are a steering committee and a new technology group. An OISP steering committee would be comprised of representatives from top management, user groups and IS personnel, with membership changes being made on a rotating basis. The committee would be responsible for overseeing an education program that links organizational objectives with IT, for ensuring that OISP goals

become part of every significant organizational project, and for selecting individuals for participation in project teams. A new technology group would be composed of a small number of IS personnel responsible for investigating IT opportunities and preparing presentations and reports for incorporation into the education program. The technology group would also aid the steering committee and project teams in gaining a more comprehensive understanding of specific technologies. Together, these two groups serve to create an environment that is both a prerequisite and a critical tool for successful OISP.

In addition to its role in maintaining an appropriate environment, the OISP steering committee should also sponsor its own projects. As suggested by experience with the Organizational approach, the committee can obtain the greatest combined impact by clustering projects around predefined themes that are driven by organizational objectives. Examples of themes include focusing on lowering administrative costs or becoming the highest quality producer of a certain product. As anecdotal evidence in the BPR literature illustrates, processes are a logical place for most organizations to look for project ideas. As a good initial project, the steering committee could assign a cross-functional team the task of identifying processes to reengineer. Such a project would benefit from adopting one of the methodologies suggested by Hammer & Champy (1993), Davenport (1993), or others, supplemented with organizational modelling techniques and tools popular in the Technological approach to SISP. Based on this initial project, additional teams could be organized to redesign specific processes, where once again BPR methodology and Technological based tools could be utilized.

Focusing on processes is one useful avenue for generating project ideas, but it is not the only one. Process reengineering is basically a top-down approach that has great potential for

generating strategic IS plans. However, organizations using the bottom-up Administrative approach to SISP have also been able to make strategic IS investments. The steering committee therefore should establish a formal mechanism that will allow users to make project proposals. It is important for the steering committee to realize that their job is to encourage the discovery of new project ideas regardless of source, and to package these ideas into meaningful themes. Moreover, the steering committee must look for ways to capture the lessons learned during projects so that these experiences can be passed on during the training of future project team members. Even if the steering committee is unable to generate its own project ideas, it still serves an important role in ensuring that projects sponsored by other organizational groups have IS planning as part of their mandate, and are supported by team members who are knowledgeable about IT.

4.1.5 Applying OISP

As discussed above, there are a number of fundamental actions that must be taken early on after deciding to adopt OISP. These actions and a suggested order in which they should be accomplished are summarized in Table 18.

Table 18: Fundamental OISP Actions after Adoption

Order	Action
1	Establish an OISP steering committee, define its mandate, and select themes.
2	Create a new technology group and assign a list of technologies to investigate.
3	Establish a process identification team to assess reengineering potential.
4	Develop mechanisms for capturing user input and for communicating results.
5	Implement an organizational education program for top management and users.
6	Begin to assign personnel to regular committees, and process redesign teams.

By now it should be clear that the OISP approach developed here is not a simple step-by-step methodology. Traditionally, organizations would engage in IS planning whenever they felt a strong need to develop a strategic IS plan. The emphasis of the OISP approach, however, is the creation of a climate where IS considerations become habitual and an embedded part of organizational thinking. Continuous education lays the groundwork for organizational learning, the benefits of which are a readiness to see how IT can be used to tackle problems and improve performance. Under OISP, there would not be an IS planning team charged specifically with the task of producing a long-term IS plan, rather IS planning initiatives would emerge from the multidisciplinary teams formed as a natural response to organizational challenges. The ultimate goal of OISP is to raise the status of IT to the point where it is viewed as a fundamental organizational resource. Once this is accomplished, the organization will begin to use IT as the inspiration for both continuous improvement and more innovative project ideas.

It is important to note that the concepts presented as the OISP approach are necessarily general, and that their application in a specific organizational setting requires that adjustments be made to account for differences in existing knowledge and practices. In other words, developing OISP into an approach that has very detailed steps and activities would be counter-productive considering the effort that would be required to adapt it to each new setting. An organization that already has an advanced technology group, an IS steering committee, or uses an Organizational approach to SISP will be much farther ahead in creating an OISP environment than an organization that has only had experience with something that resembles the Administrative approach to IS planning. Perhaps the greatest challenge for an organization that adopts OISP will be to maintain top management's commitment to an appropriate education program. The key to overcoming resistance to training efforts is to ensure that IS initiatives

reach implementation, and then to communicate education's role back to top management. The continued success of OISP is dependent upon the constant attention of a steering committee that is prepared to make changes to its education program as the organization evolves.

4.2 OISP IN A CHARITABLE ORGANIZATION

Although not expressly stated in either the SISP or BPR literature, both sets of approaches seem implicitly to have been conceived with the average large, for-profit organization in mind. Clearly, not all organizations, nor the majority of the enterprises in today's world fit this mould. A class of organization that is perhaps the antithesis of the large for-profit is the small, volunteer-based charitable organization. The question that naturally arises then is, can SISP, BPR or OISP be applied in a charitable organization? Further, how must the adopted approach be adapted for this environment? An understanding of the fundamental differences between the classic large for-profit enterprise and a typical charitable organization will begin to answer these questions.

4.2.1 Dimensions

Size is one obvious distinction that has many implications for organizations considering OISP. Smaller organizations tend to have considerably less financial and human resources to devote to both general and IS planning efforts. Financial constraints impose strict limitations on the ability to invest in new technologies, to provide the necessary training of personnel, or to hire outside consultants. There are likely to be fewer specialists in a small organization as employees take on a wider range of tasks and responsibilities out of necessity. As a result, devoting key personnel full-time to a planning team carries a greater risk. Moreover, redesigning processes may be less beneficial since the processes themselves are likely to be

simple and involve fewer tasks. The maturity of the IS department, if one even exists, is probably considerably less than what would be found in a large organization, which may present an obstacle to the application of modern IT or the use of sophisticated methodologies. Potentially positive implications of smaller size are more readily identifiable processes, easier top to bottom communication, and less time required for completion of OISP projects.

Most executives would agree that a customer focus, a keen awareness of the competition, and attention to the bottom-line are essential to the survival of most for-profit organizations. Non-profits, on the other hand, tend to be driven by more idealistic visions, where the concepts of customer, competition, performance measures, and budgetary constraints take on entirely different meanings. The outputs of non-profit organizations may or may not include products or services, and the connections to the ultimate recipients, or customers, are often weak in comparison to for-profit companies. Non-profit organizations often seek to obtain resources from governments and the public in general, and therefore are competing with all of the other demands placed upon these groups. Standard business performance metrics like time, cost, and quality may be more difficult to define or measure, and in some cases are simply less important. Clear bench-marks and future performance targets are crucial to assessing the results of OISP projects, but its not clear what these measures should be based upon for many non-profit organizations. Most non-profit organizations are highly budget oriented, yet failure to achieve desired goals is of considerably less consequence for some non-profits than it is for a typical for-profit corporation.

Another important distinction for many charities is the importance of the role played by volunteers. In charitable organizations, staff and volunteers often work side by side in the

pursuit of organizational objectives. In many cases, volunteers are both the front line workers, and through participation in a committee structure, a significant decision making body with priority setting responsibilities. The nature of a volunteer work force has many ramifications for conducting OISP. The majority of volunteers have at best a regular part-time commitment, and more commonly only an episodic association with an organization. Moreover, volunteers may greatly outnumber a charitable organization's employees, with considerable fluctuations in numbers over any given period. Gaining the kind of commitment and participation that OISP requires over the long-term from a volunteer force presents a particularly difficult challenge. As well, investments in training and the acquired knowledge of the volunteers can disappear quickly as they move on. On the other hand, volunteers are there by choice and are often deeply concerned with the success of the charity, and this motivation can be a key resource for planning efforts.

4.2.2 Implications

Overall, these differences suggest a number of meaningful adjustments that should be made when conducting OISP in a charitable setting. Given the importance of maintaining organizational memory, the steering committee should have a stable core group that does not change along with the regular membership. Considering the smaller size, less complex OISP projects should be selected with team members working on a rotating basis so that the organization is not adversely affected by the absence of key personnel. A charity would generally be better off using relatively simple methods and must concentrate on implementation. This may be best accomplished via a series of smaller projects, thereby avoiding the detrimental repercussions of the failure of a large and time consuming initiative. If it has not already done so, the charity should work to define its own performance measures that reflect its mission and

objectives. Pursuing its own metrics rather than the typical business measures will aid the charity in focusing on its unique needs. A charity should also not be afraid of investing in its volunteers since they can serve as committee members, as well as be an invaluable source of insight into organizational operations. Moreover, even volunteers who leave may inspire others to join once they learn of the education and experience that can be gained from working with the charity.

4.3 OISP & THE CCS

The B.C. & Yukon Division of the CCS is, for the most part, a typical charitable organization, and the adjustments to OISP for charities that were described above are certainly applicable. The OISP approach was not used during the CCS case study because it was not developed until after the project had been completed. However, the in-depth knowledge of the Division acquired during the study can be used to speculate about how well the approach would work in this particular setting. Moreover, additional recommendations for linking the planning priorities that resulted from the project with the adoption of the new OISP approach can now be made. General comments about the suitability of OISP for the Division, along with more specific suggestions and examples are given in the rest of this section.

4.3.1 Promoters & Inhibitors

Adopting the OISP approach in many respects represents a pivotal change for the Division in terms of IS planning, one that would require some time to take effect. Currently, IS planning resembles the Administrative approach, which is a reflection of the Division's traditional bottom-up decision making style and emphasis on short-term planning. The Division already has a data processing department and a significant investment in IT, so it does recognize

the importance of IS for maintaining productive operations. However, the average level of IT knowledge among management, staff and volunteers is relatively limited. The Division's experience in using an IS literate cross-functional task force to develop computer acquisition policies should provide the basis for forming an OISP steering committee, but vesting it with the required decision making authority will be a much larger step. Overall, a move to OISP will be aided by a parallel migration to a more business-like attitude and a healthy concern for long-term organizational planning. While the adoption of OISP may not be the Division's number one priority, it is apparent that it has the ability and the need to take deliberate steps in that direction.

4.3.2 Ties to Planning Priorities

The Division can clearly benefit from linking the sample analysis planning priorities that resulted from the project with the adoption of the OISP approach. An OISP steering committee's first order of business would be to create a charter outlining its responsibilities and obligations. The membership of the steering committee would make it an ideal group for attending to the suggested priorities of updating the Data Processing Philosophy and developing principles to guide project selection. Moreover, the steering committee would also be perfect for overseeing the formation of teams to attend to the planning priorities related to the distribution of IS resources and the management of end-user computing. A new technology group's (which may actually be only one person) OISP responsibilities mesh well with the planning priorities of ensuring an adequate IS skill base, and investigating client-server computing. The process of establishing an OISP environment has the double advantage for the Division of both positioning itself for future planning efforts and addressing the immediate IS planning priorities that emerged from the project.

4.3.3 Links to Reengineering

Once the planning priorities have been attended to as part of constructing an OISP environment in the Division, the steering committee should look to sponsor two key process oriented projects. The first project team would be responsible for defining who the Division's customers are, the outcomes that each receives, and the competition that exists. The team should then develop performance measures that reflect these definitions. These performance measures in turn will provide the basis for generating project themes that will focus the Division's efforts, and can also serve as metrics for establishing baseline bench marks for the evaluation of implemented project initiatives. The second project team should work to identify the Division's main processes, and prioritize them by reengineering potential. A model that displays the Division's existing processes, combined with impressions of the reengineering potential and risk related to each will aid the steering committee in assigning redesign project priorities.

Basic examples of the areas that should be addressed by the two project teams are useful for visualizing how these suggestions may be implemented. Some brief initial definitions of the Division's customers, the outcomes they receive, and the existing competition are provided in Table 19. Operating performance parameters taken from a classification scheme developed by Davidson (1993) and examples of possible corresponding measures are given in Table 20. A sample model or diagram that shows the Division's stakeholders, its boundary processes that have direct links to the stakeholders, and its internal processes that support the boundary processes is shown in Figure 8. Finally, Table 21 illustrates some factors or criteria that could be considered when assessing the reengineering potential of processes in order to develop a ranked list of potential projects.

Table 19: Possible Initial Definitions

Aspect	Definition
Customers:	Three existing customer types include donors, patients and volunteers. Potential customers include any member of the community.
Outcomes: Donors Patients Volunteers	Receive peace of mind and a feeling of having done well. Receive help in dealing with emotions and financial expenses. Receive useful work experience and a feeling of having done well.
Competition: Donors Patients Volunteers	All other non-profits and charitable organizations. Related non-profits or charitable organizations. Other demands on time including work and other volunteer associations.

Table 20: Example Performance Measures

Performance Parameter	Selected Metrics & Example Measures
Productivity: Overall efficiency Staffing efficiency Staffing levels Transaction costs	Output per unit of labour or capital, variable transaction costs. Percentage of revenue consumed by administration expenses. Number of donations processed per staff person. Number of staff per number of volunteers. Cost per donation processed.
Velocity: Special events	Cycle times. Percentage of pledges received X days after the event.
Quality: Lodges	Life expectancy and life-cycle costs. Percentage of requests for stays satisfied. (see Note 1) Performance ratings on a 1 to 10 scale completed by guests.
Precision: Donors Patients	Mass customization and microsegmentation activity. Number of different types or categories of donors. Number of categories of patients with different cancers.
Service: Donors Volunteers Patients Education	Retention rates, loyalty, customer satisfaction. Percentage of first time and repeat donors. Retention rates for volunteers over time. Percentage of patients receiving financial aid. Percentage of queries answered by the Information Line.

Note: Generic Performance Parameters taken from Davidson (1993)

Note 1: Important given that amount received decreases after time.

Figure 8: B.C. & Yukon Division Activity Diagram

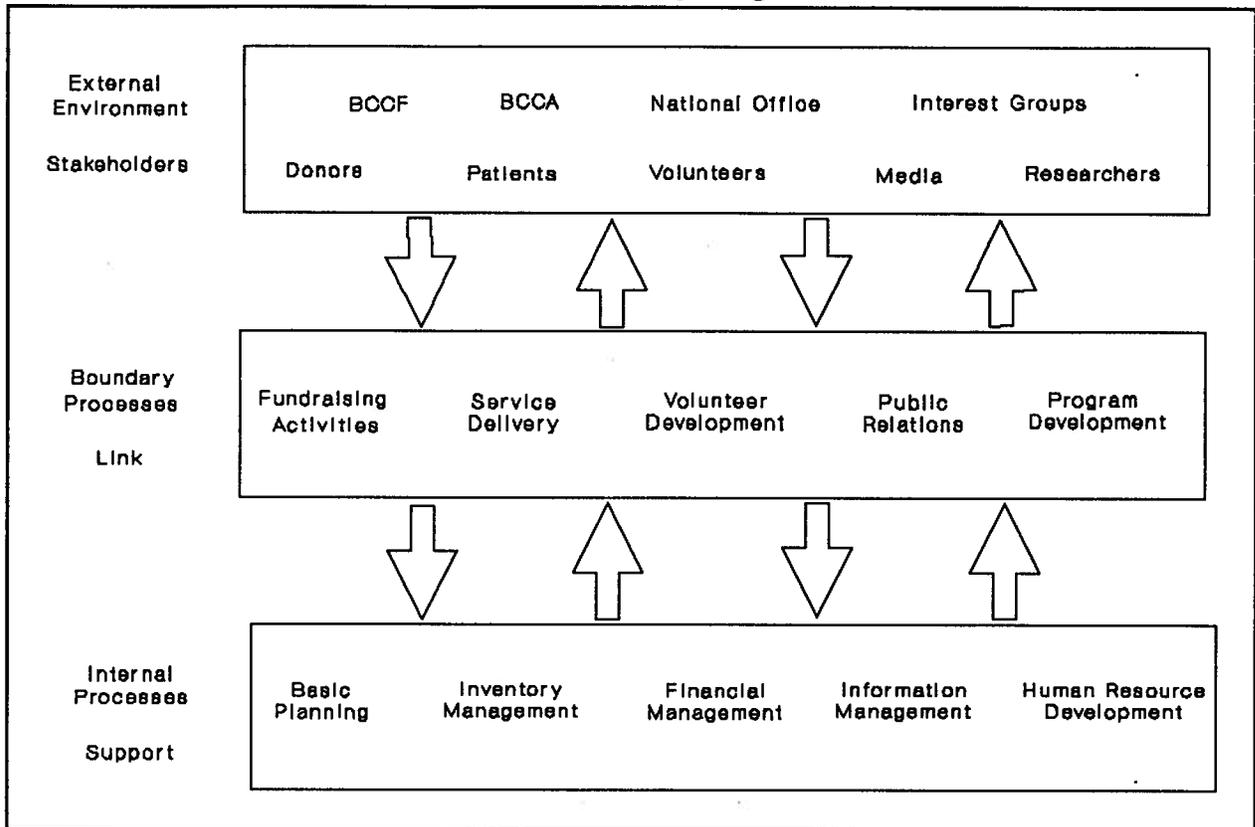


Table 21: Sample Ranking Criteria

Process	Performance Reward	Risk of Failure	Theme Alignment	Overall Rating
Process A	High	Medium	High	High
Process B	Medium	Medium	Medium	Medium
... Process X

Note: Quantitative scales could be used in place qualitative for more precision.

These definitions, example measures, activity diagram, and sample criteria are only intended to stimulate thinking and get the Division pointed in the right direction. The initial definitions are incomplete and only reflect the opinion of the researcher. The list of performance parameters has been drawn from work done by Davidson (1993), but performance parameter classifications developed by other authors may be just as relevant. The activity

diagram is an attempt to demonstrate that there are at least two different kinds of processes, those that link the organization with its external environment and those that are entirely internal. Other diagrams or models illustrating different relationships between processes or between the organization and its environment could also prove extremely useful. The sample ranking simply uses the mean score of basic composite criteria that are relevant for any reengineering assessment. Depending on its particular needs, an organization may wish to break these criteria down into sub factors, add additional criteria, or use more sophisticated means for determining the overall rating. What is really required is a team of Division staff and volunteers with the appropriate knowledge and time to fully explore these ideas to the point where they become useful for the organization.

Once these two base process projects have been completed, the steering committee can begin to assign teams to redesign selected processes. While the BPR literature provides guidance for identifying processes, little has been written about process analysis. It is important to develop a method for describing a process, for decomposing it into a set of related activities, and for identifying potential improvements. Some useful suggestions in this area come from Wand (1994). For describing a process, he suggests that they be viewed as a network of sequenced activities where each activity has inputs and outputs, employs methods, and consumes resources. A process can be represented graphically by using boxes for the activities and arrows between them to represent their precedence relationships. Process improvements can then be explored by considering whether an activity can be eliminated, split, combined, improved, or connected to other activities by new precedence relationships. This is one possible method for analyzing processes, other may exist, but what is important is that the Division use one that it is comfortable working with.

4.4 THEORY SUMMARY

The primary purpose of the theory section was to deal specifically with the two research questions proposed for the thesis, that is, how to integrate SISP with BPR, and how to apply the resulting approach in a charitable organization. The integration question was addressed in a series of steps. The first step entailed looking at SISP and BPR in terms of a simple organizational model that illustrates the relationship between processes and other organizational aspects. The second step involved examining the assumptions, strengths and weaknesses of SISP and BPR. In the third step, principles were selected for inclusion in an integrated approach based upon the organizational model and approach analysis. The resulting principles were grouped to form the two principle features of the OISP approach, establishing an environment that depends on effective interaction between a steering committee and a new technology group, and engaging in committee sponsored projects. The generality and continual nature of the OISP approach represents a significant departure from classical SISP methodologies which present very detailed means of creating IS plans.

In responding to the question of applying the proposed OISP approach in a charitable organization, the organizational dimensions of size, profit orientation and volunteer workforce were explored. Based on these generic differences, implications for OISP in terms of charities in general and the CCS in particular were discussed. This was followed by recommendations to establish an OISP environment in the Division in parallel with satisfying the planning priorities that emerged from the planning project. Additional suggestions were also made on two critical process oriented projects intended to define customers, establish appropriate performance measures, and investigate process reengineering potential. Finally, some thoughts on how

project teams can go about documenting and redesigning processes were presented. While perhaps not completely putting the two research questions to rest, this discussion has hopefully provided useful principles and direction.

5. CONCLUSIONS

5.1 SUMMARY

This thesis began as the very practical problem of how to evaluate and make recommendations about the information systems (IS) needs of the B.C. and Yukon Division of the Canadian Cancer Society (CCS). The problem was quickly translated into one of IS planning in the context of a charitable organization. It became evident that the two most relevant sets of literature, Strategic Information Systems Planning (SISP) and Business Process Reengineering (BPR), lacked the specifics necessary to provide appropriate direction on how to complete such a task. As a result, the work done for the CCS was not a simple planning exercise using a given methodology. Rather, the project required the careful consideration of many different methods and techniques related to both SISP and BPR in order to develop an approach suitable for the CCS setting. The CCS project also represented an opportunity to explore ideas about how to combine the best elements of SISP and BPR into a comprehensive approach, an eclectic IS planning approach called Organizational Information Systems Planning (OISP) was proposed. OISP was discussed in terms of how it should be adapted for use in charities, with the case of the B.C. and Yukon Division of the CCS being used as an illustrative example.

5.2 CASE STUDY & THEORY LINKAGES

A number of clear linkages can be made between the planning approach used during the case study with the CCS and the proposed OISP approach. The two critical planning components of the case study were the organizational overview and the sample dimensional analysis. Each of these components could be usefully employed by any organization interested in adopting OISP. An organizational overview provides the kind of information that would make such an activity a valuable prelude to establishing an OISP environment. Similarly, dimensional analysis

is a technique that could be easily employed in different project settings. Some specific ideas on how an organizational overview and dimensional analysis can be utilized by an organization looking to embrace OISP are provided below.

In order to create a working OISP environment, an organization must be able to clearly delineate its key objectives, understand its structure, and be aware of the fundamental challenges it faces. An organization wide study, such as the one done with the CCS, can supply this information. The identified objectives must be incorporate into the OISP education program so that members of the organization share a common vision. Knowledge of structure and operations will determine which groups require or deserve representation on the OISP steering committee. Finally, an appreciation of both objectives and challenges will guide the development of the steering committee's mandate, and the formation of appropriate OISP project themes. In this light, an organizational overview could be seen as necessary prerequisite or at least as a valuable tool for establishing an OISP environment.

The dimensional analysis done with the CCS entailed a comprehensive examination of the entire organization along four distinct dimensions. This form of broad analysis could be used by an OISP steering committee to identify gaps between needs and existing IS, thereby generating ideas for IS planning projects. A modified analysis that used technology as a key dimension could be utilized by a new technology group to explore the impact potential of the application of recent IT advances for the organization. Individual project teams could also usefully employ a more focused dimensional analysis by limiting the scope applied to a particular dimension or using fewer dimensions. For example, a particular team's requirements may imply that it only needs to examine the relationship between a single organizational objective and the

structure dimension. Dimensional analysis is a technique that an organization can simply pull from its toolbox anytime an applicable need exists.

Another interesting connection between the case study and the theory behind OISP are the parallels in the dimensions used in the sample analysis with the components of the simple organizational model. Basic organizational aspects like objectives, structure and technology were used as dimensions and were represented in the organizational model. This of course is logical because the model was intended to depict all fundamental aspects of the organization. The importance of making this connection is that the "diamond" organizational model provides a list of potential dimensions for use in analysis. For example, the processes component is a key organizational dimension that was not used during the CCS project, but one that could be utilized in other analyses. In summary, although the case study and theory development occurred in separate time frames, underlying relationships clearly exist between them.

5.3 SPECIAL CIRCUMSTANCES

Some special circumstances that were present during the course of the project with the CCS are worth noting. Although it is likely common to charities and other small non-profit organizations, the CCS has only recently adopted a more business like approach. As a result, long-range planning and evaluation of objective achievement are only now becoming high priorities, which means that more preparatory work is required to do IS planning than in most business settings. However, the many modern management fads that have resulted in the so called corporate 'flavour of the month programs' are also absent in charitable organizations, which seems to make staff and volunteers less resistant to change. Another important realization involves acknowledging the effect of having an outsider acting as the principle instigator of a

planning project. An outsider has a certain assumed objectiveness and is capable of visualizing fresh ideas, but often lacks the authority or backing necessary to sustain a project from inception to implementation. In the case of the B.C. and Yukon Division, recent changes in leadership were accompanied by an increased willingness or desire to improve operations, and this also provided a special motivation for engaging in a planning project. The exact effects of these circumstances were not investigated, however, it is clear that the application of IS planning approaches such as OISP can be effected by the unique situations that exist in every enterprise.

5.4 LIMITATIONS

There are a number of obvious limiting factors derived from the fact that the thesis was initiated by an IS planning project request made by a single organization. Perhaps the most significant implication of the practical nature of the thesis is that the theoretical development of OISP was done after the completion of the CCS project, so it was not tested directly during the case study. Moreover, many of the ideas that served as the basis for the development of OISP were the result of working with one particular charitable organization. A related concern is that OISP is not based on an evolving tradition of research from a number of authors, but rather is a reflection of the potentially biased views of a single researcher. Although these concerns are not unimportant, they are not completely unexpected either. Existing approaches are known to be strong on method but weak on process and implementation. The OISP approach represents a first cut at creating a simple yet balanced approach that can be easily used by today's organizations. OISP is uniquely valuable because it combines notions from SISP and BPR, which seem implicitly designed for large for-profit corporations, and examines how such an approach can successfully be used in what appears to be a typical charitable organization.

5.5 FUTURE DIRECTIONS

The OISP approach is a useful start to developing a means by which any organization can incorporate IS planning into an accepted element of its overall planning processes, however, much more work needs to be done. The linkages between OISP and its theoretical basis in SISP and BPR need to be expanded so that the emergence of OISP ideas can be further explained. OISP should be developed in greater detail, applied in a number of different types of organizations, and refined in order to ensure that it is sufficiently generic for nearly universal application. As well, research is required to study the effectiveness of OISP in comparison to other popular approaches currently in use, and to gain an understanding of its strengths and weaknesses. The long-term value of this thesis is dependent upon other researchers seeing OISP as an interesting beginning, one that is worthy of their time and effort to cultivate into something that can be utilized by academics and practitioners alike.

BIBLIOGRAPHY

- Atkinson, Robert A., and Montgomery, Judith, "Reshaping IS Strategic Planning", *Journal of Information Systems Management*, Fall 1990, pp. 9-17.
- Atkinson, Robert A., "Positioning a Strategic Planning Initiative for Success", *Journal of Information Systems Management*, Winter 1991, pp. 67-70.
- Atkinson, Robert A., "Capturing the Full Impact of IT", *Journal of Information Systems Management*, Summer 1991, pp. 53-56.
- Atkinson, Robert A., "The Real Meaning of Strategic Planning", *Information Systems Management*, Fall 1991, pp. 57-59.
- Atkinson, Robert A., "Keeping IS Strategic Plans Off the Self", *Information Systems Management*, Winter 1992, pp. 68-71.
- Atkinson, Robert A., "Applying the 80/20 Rule: Making It Work for IS Plans", *Information Systems Management*, Summer 1992, pp. 57-59.
- Barrett, John L., "Process Visualization: Getting the Vision Right Is Key", *Information Systems Management*, Spring 1994, pp. 14-23.
- Bashein, Barbara J., Markus, Lynne M., and Riley Patricia, "Preconditions for BPR Success: And How to Prevent Failures", *Information Systems Management*, Spring 1994, pp. 7-13.
- Carter, Richard B., Nilakanta, Shree, and Norris, Daniel, "Information Systems Planning: A Case Study", *Journal of Systems Management*, July 1990, pp. 10-15.
- Conrath, David W., Ang, James S. K., and Mattay Shankar, "Strategic Planning for Information Systems: A Survey of Canadian Organizations", *INFOR*, Volume 30, Number 4, November 1992, pp. 364-377.
- DMR, "Information Technology Enters a Second Era", *Business Week*, October 25, 1993, (special advertising section).
- Davenport, Thomas H., *Process Innovation*, Harvard Business School Press, Boston, MA, 1993, ISBN 0-87584-366-2
- Davenport, Thomas H., and Short, James E., "The New Industrial Engineering: Information Technology and Business Process Redesign", *Sloan Management Review*, Summer 1990, pp. 11-27.
- Davidson, W.H., "Beyond re-engineering: The three phases of business transformation," *IBM Systems Journal*, Vol. 32, No. 1, 1993, pp. 65-79.

- Earl, Michael J., "Experiences in Strategic Information Systems Planning", *MIS Quarterly*, March 1993, pp. 1-20.
- Flaatten, Per O., et. al., *Foundations of Business Systems: Second Edition*, The Dryden Press: Orlando, 1992.
- FORTUNE*, "The Promise of Reengineering", May 1993, pp. 94-97.
- FORTUNE*, "Reengineering: the Hot New Managing Tool", August 23, 1993, pp. 41-48.
- Gartner Group*, "Client/Server Computing in the 1990s", Information Technology Management Academic Program, R-001-102, January 6, 1994.
- Guha, Subashish, Kettinger, William J., and Teng, James T.C., "Business Process Reengineering: Building a Comprehensive Methodology", *Information Systems Management*, Summer 1993, pp. 13-22.
- Hammer, Michael, "Reengineering Work: Don't Automate, Obliterate", *Harvard Business Review*, July-August 1990, pp. 104-112.
- Hammer, Michael, and Champy, James, *Reengineering the Corporation: A Manifesto for Business Revolution*, Harper Business, New York, NY, 1993, ISBN 0-88730-640-3.
- I/S Analyzer*, "Establishing a Client/Server Framework", November 1993, Vol. 31, No. 11.
- I/S Analyzer*, "The Role of IT in Business Reengineering", August 1993, Vol. 31, No.8.
- I/S Analyzer*, "Usability and Client-Server Computing", March 1992, Vol. 30, No. 3.
- King, William R., "Process Reengineering: The Strategic Dimensions", *Information Systems Management*, Spring 1994, pp. 71-73.
- King, William R., "Strategic Planning for Management Information Systems", *MIS Quarterly*, Volume 2, Number 1, March 1978.
- Klien, Mark M., "Reengineering Methodologies and Tools: A Prescription for Enhancing Success", *Information Systems Management*, Spring 1994, pp. 30-35.
- Laware, Gilbert W., "Strategic Business Planning: Aligning Business Goals with Technology", *Information Systems Management*, Fall 1991, pp.44-49.
- Leavitt, H., "Applied Organizational Change in Industry: Structural Technological and Humanistic Approaches, in *Handbook of Organizations*, March, J., Ed., Chicago: Rand McNally & Co., 1965, pp. 1145.

- Lederer, Albert L., and Sethi, Vijay, "Root Causes of Strategic Information Systems Planning Implementation Problems", *Journal of Management Information Systems*, Summer 1992, Volume 9, Number 1, pp. 25-42.
- Lederer, Albert L., and Gardiner, Veronica, "Strategic Information Systems Planning: The Method/1 Approach", *Information Systems Management*, Summer 1992, pp. 13-20.
- Maurer, Paul, and Silver Jerry, "Sizing Up Downsizing: Benefits and Challenges of Client-Server Computing", Oracle Corporation, Informatics 93 Presentation.
- Ryan, Hugh W., "Reinventing the Business", *Information Systems Management*, Spring 1994, pp. 77-79.
- Stewart, Thomas A., "Welcome to the Revolution", *FORTUNE*, December 1993, pp. 66-77.
- Tayntor, Christine B., "Customer-Driven Long-Range Planning: Integrating EUC into IS Planning", *Information Systems Management*, Fall 1993, pp. 13-20.
- Wand, Yair, "Business Process Reengineering - How to Analyze for Process Redesign", *Class Notes for Commerce 439*, University of British Columbia, 1994.
- Wang, Richard Y., *Information Technology in Action*, Prentice Hall, Englewood Cliffs, NJ, 1992, ISBN 0132210290.

APPENDIX A: Program & District Objectives

1993-1994 AGM Program Objectives

Patient Services

1. To develop and fill vacant chairs.
2. To develop and train the Childhood and Family Volunteers for all Patient Services programs.
3. To develop and distribute a doctors' information pamphlet on Patient Services so that patients are better informed.

Public Relations

By the end of September 30, 1994:

1. To increase involvement of the medical community by recruiting at least one family physician for each Unit.
2. To improve our internal communications by receiving and replying back to time-sensitive material from Division through to Units and vice-versa within a 2-week period.
3. To seek more involvement with the multicultural community by recruiting in each Unit, where applicable, at least one volunteer from each of the following: First Nations, Chinese and Indo-Canadian.

Fundraising

1. By November, 1993, to establish a fund raising goal which provides for the approval of all 1993/94 budget programs.
2. To increase the annual revenue by:
 - increasing the household and business canvass by April 30, 1994
 - each District holding one 24-hour run by Sept. 30, 1994
 - each District holding one Longest Day of Golf by Sept. 30, 1994
 - each Unit holding one special event by Sept. 30, 1994
 - each District choosing to utilize a "Closed-access Donor" direct mail campaign in April 1994
3. To recruit volunteer chairman, vice-chairman for each District by January 15, 1994, and to identify and fill volunteer positions and train the volunteers required in each Unit by September 30, 1993.

Volunteer Development

1. To develop a generic training module including standards for use throughout the Division by December 31, 1993.
2. To establish contact with multicultural groups in Districts and Units and recruit a volunteer base by Sept. 30, 1994.
3. To review and revise as required the volunteer recognition policy and procedure by December 31, 1994.

Public Education

1. To offer a Fresh Start course in 50% of the Units in each District and hold one workshop to train Fresh Start facilitators in each District by _____.
2. To develop school Smoking and Health program resource materials packages for 9-12 year olds by _____.
3. To establish a Breast Health volunteer committee in 20% of the Units.

1993-1994 DISTRICT OBJECTIVES

Fraser Valley District

1. Campaign: Door-to-Door, Daffodil.
 - volunteer involvement
 - high profile - education tool
 - ambassadors
 - well established experience
2. Bequests
3. Jail-N-Bail.
 - fun/media
 - different part of community
 - professionals
4. 24 Hour Run.
 - community involvement
 - young people
 - family
 - media
5. Fashion Show.
6. Golf Tournaments.
7. Rent-a-Santa
8. Breast Run.
 - strong message re CCS involvement

Greater Vancouver District

By October 1994:

1. District Executive and Volunteer Development Chair - recruiting/orienting of volunteers in order to increase district wide # of 25%, filling vacancies.
2. Each Unit will take tobacco use reduction program to at least one new school.

By December 1993.

3. Improved campaign organization in place in 100% of units.

Interior District

1. To provide the necessary workshops and mini-workshops to better enable our volunteers.
2. To provide CCS programs.
3. To have a Volunteer Development Chair in each active unit to develop and maintain volunteers.
4. To hold an annual "Presidents" workshop to provide training and improve two-way communication.

Kootenay

1. To fill vacant chairs (includes vice) of units and district; youth involvement; to offer training programs and have training session at AGM in June.
2. To restructure District Council to allow East/West input without increasing size/council.
3. To better communication with our medical counterparts, ie., doctors, nurses and medical professionals; more emphasis on healthy lifestyles.
4. All units to participate in an April Door-to-Door Campaign.

Northern District

1. Workshop for F. St.
2. Develop CMP.
3. Encourage LFV RRP to the units.
4. 1 - 24 Hour Run.
5. 2 longest day of golf
6. Increase awareness of 4 and 5.

Objectives

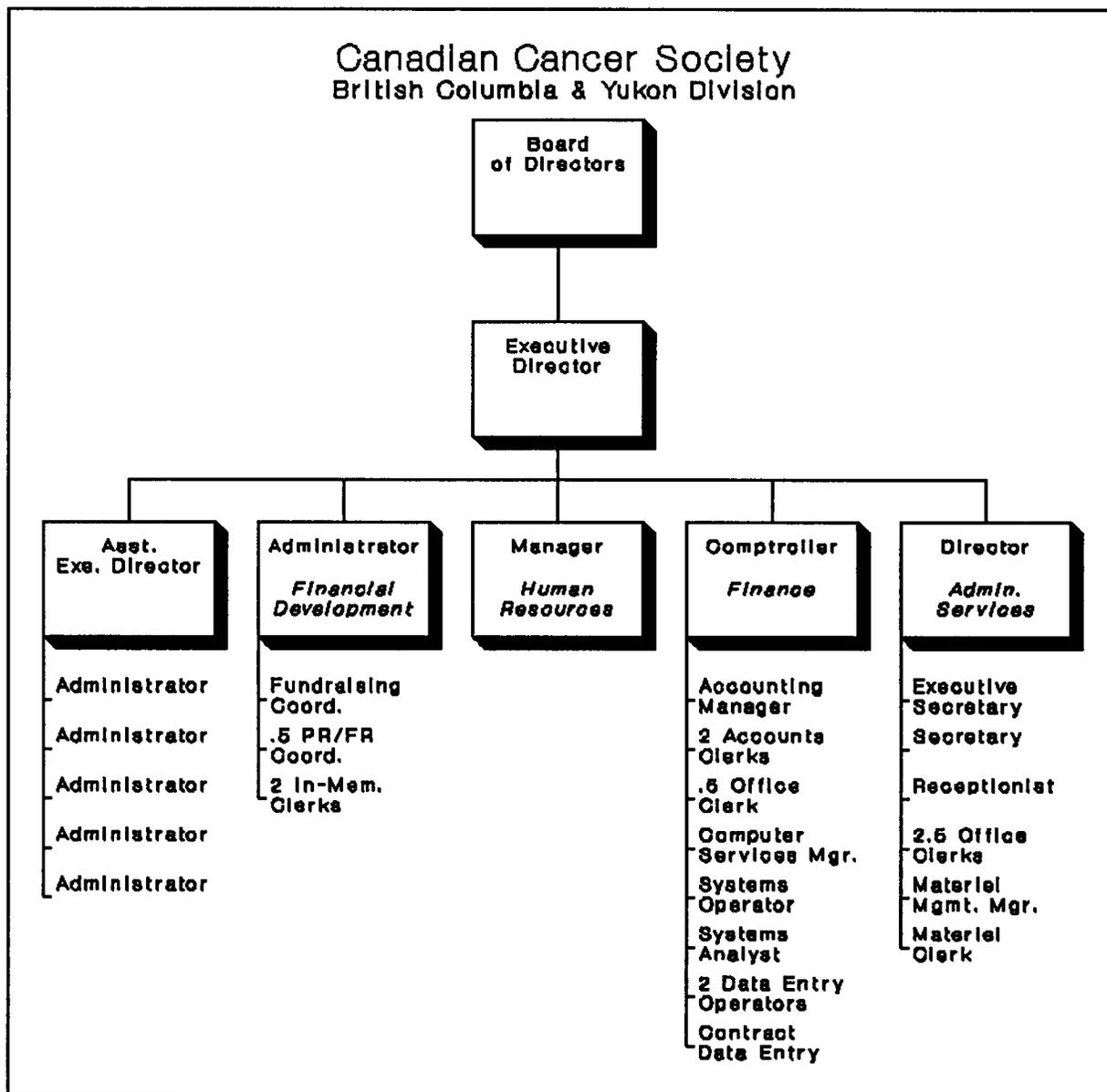
1. Volunteer Development.
2. Special Events.
3. Unit office development.

Vancouver Island District

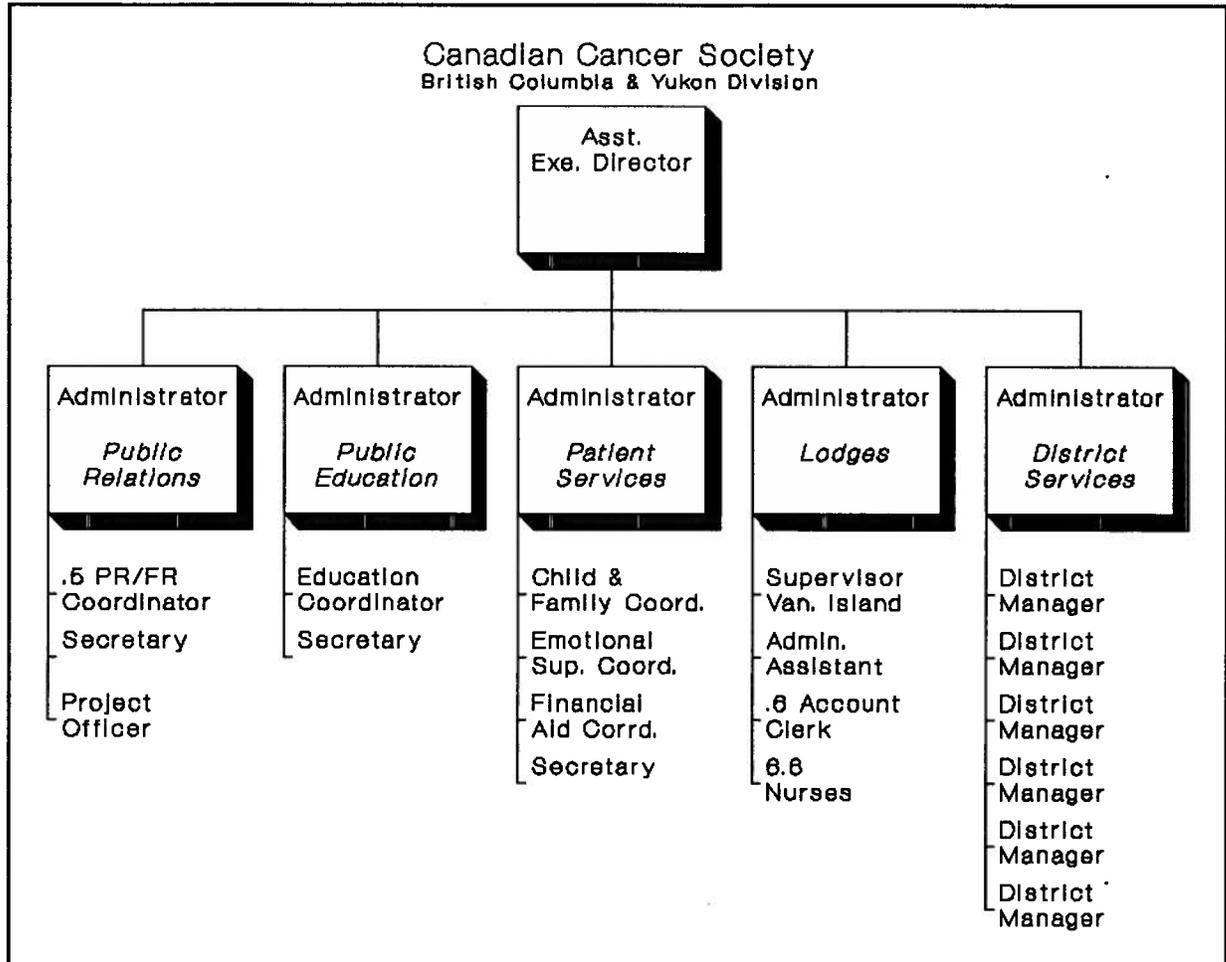
1. To develop and pilot anti-smoking programs for 9-12 year olds in at least 2 units 1993-1994.
2. To re-establish the involvement of the medial community we will add the position of medical advisor to District Council in order to increase awareness of and referrals to Patient Services of the CCS.
3. Between June 1993 and March 1994, to establish a competent Residential Campaign organization in each unit.
4. By September 30, 1994, to recruit, where applicable, at least one volunteer from each of the following communities: First Nations, Chinese, Indo-Canadian.
5. By September 1994, to have trained one volunteer in each Island unit to do orientation and training of unit volunteers.

APPENDIX B: Organization Chart & Committee Overlay

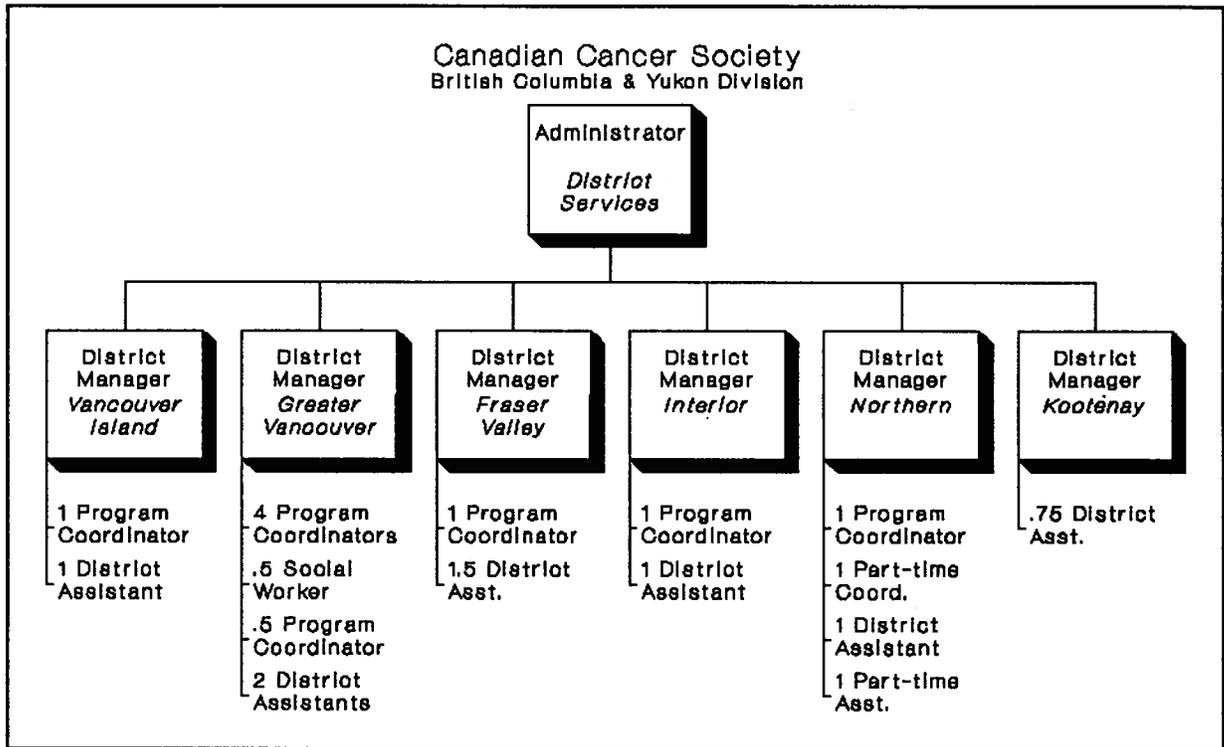
Organization Chart 1



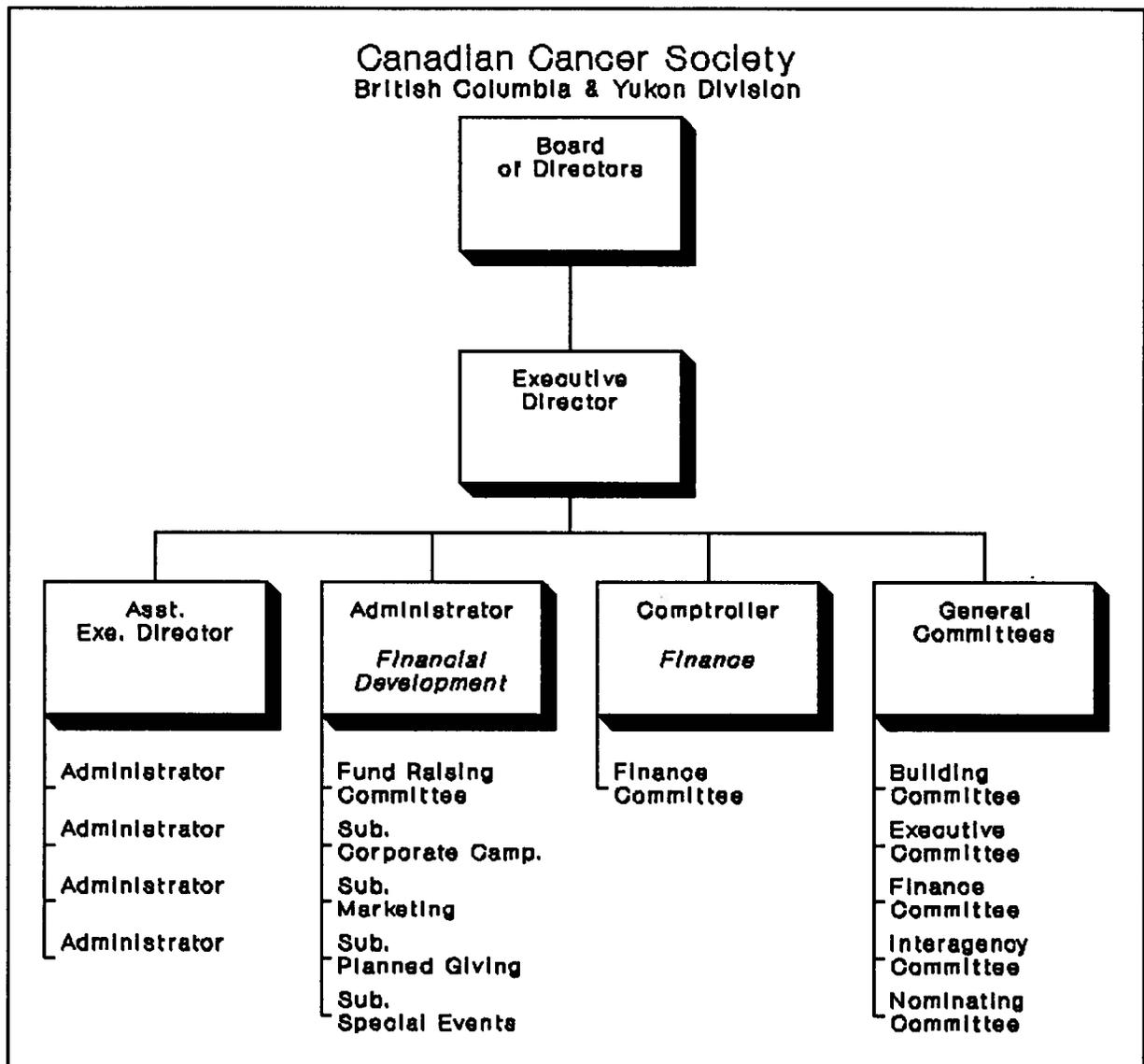
Organization Chart 2



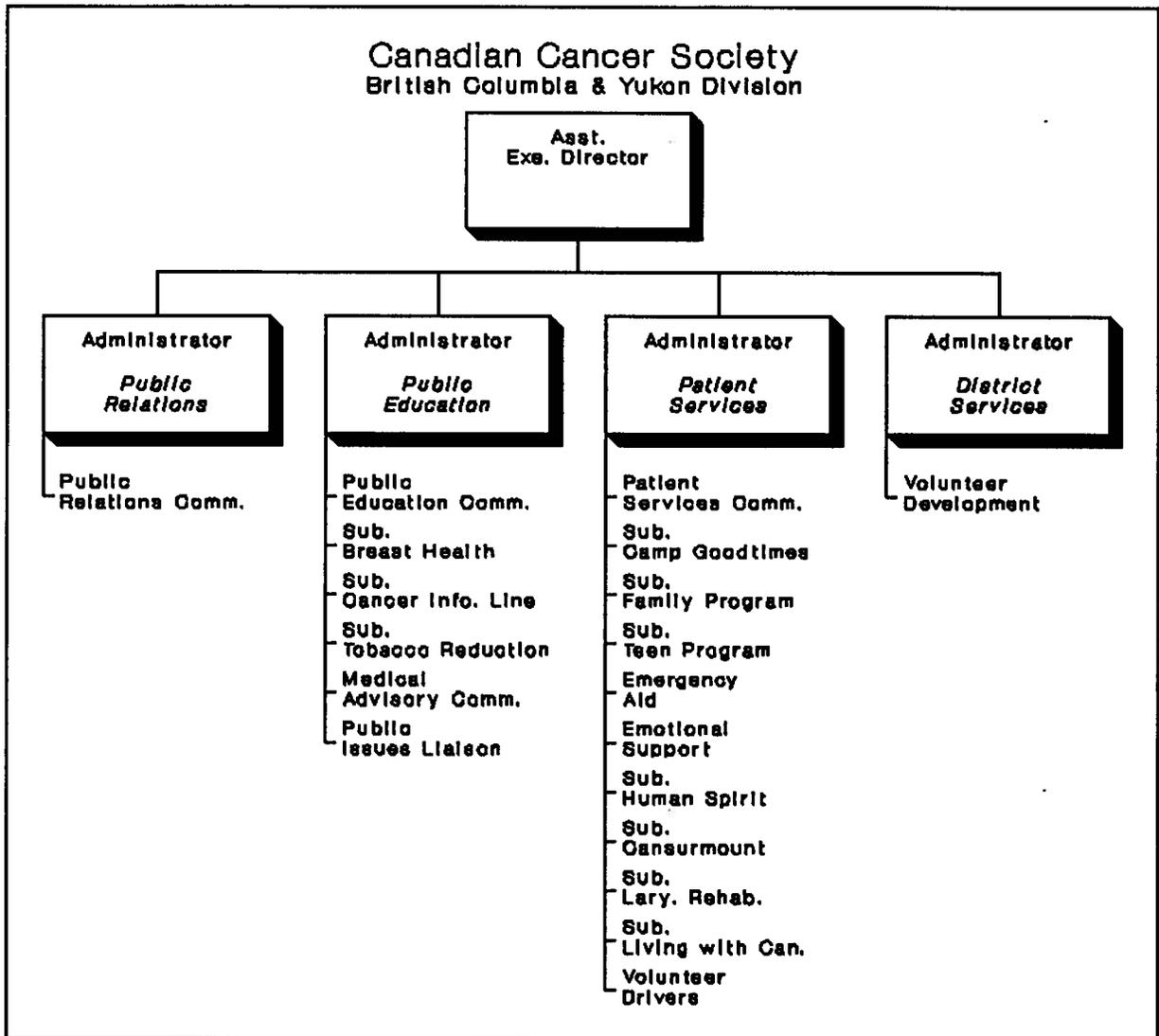
Organization Chart 3



Committee Overlay 1

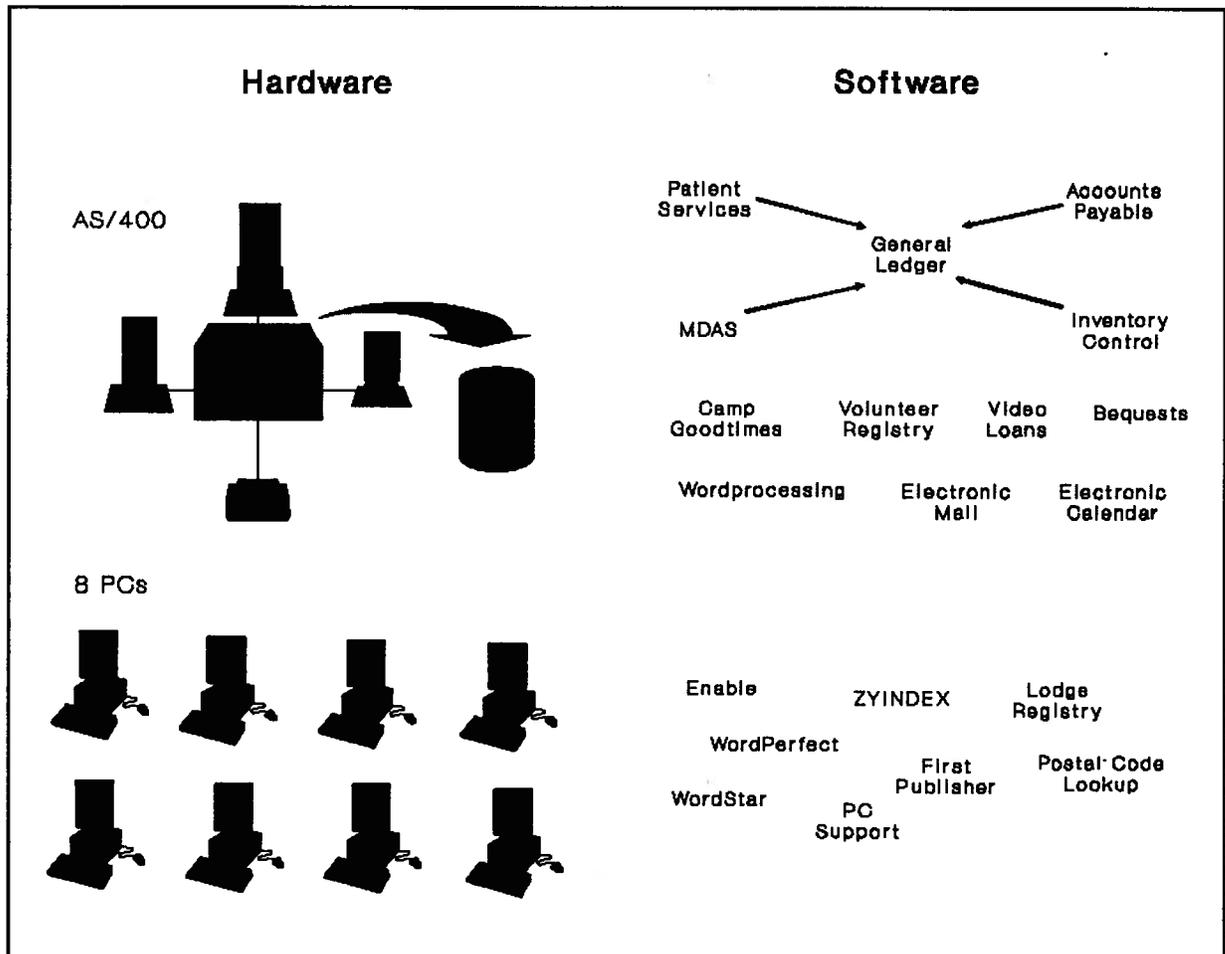


Committee Overlay 2



APPENDIX C: Division Office Systems

The hardware used by the Division office currently consists of an IBM AS/400 minicomputer with attached terminals and PCs, eight stand-alone PCs, and various associated printers. The PCs attached to the AS/400 are used both as terminals and for running personal productivity software such as WordPerfect. The stand-alone PCs serve a variety of purposes from running the Cancer Information Line research document database, to providing upload/download capabilities, to serving as dedicated application stations. A pictorial summary of the AS/400 and stand-alone PCs, along with the applications used on them, is provided below. This is followed by more detailed descriptions of the office's custom applications.



CUSTOM APPLICATIONS

General Ledger

- Hardware:** AS/400.
- Software:** Canned package customized for CCS use.
- Users:** Finance / Accounting department.
- Purpose:** To maintain financial accounting data for audit purposes, and to track performance of investments.
- Inputs:** Revenue information electronically transferred from MDAS. Expense data electronically transferred from the Patient Services, Accounts Payable, and Inventory Control & Order Entry systems.
- Outputs:** Standard monthly and quarterly financial statements for distribution to Administrators, District Presidents, and District Managers. Additional ad hoc queries and reports can be produced upon request. The standard reports include:
- Summary Comparative Operating Statement
 - Consolidated Operating Statement
 - District Operating Statement
 - Detailed District Operating Statement
 - Monthly District Breakdown
 - General Ledger Report
- Notes:** The GL is divided into 3 funds. The General Fund where most revenue and expense information is applied, a Building Fund for investments related to new lodges, and the Terry Fox Fund which is no long in use.

Master Donor Accounting System (MDAS)

- Hardware:** AS/400
- Software:** Canned package customized for CCS use.
- Users:** Financial Development department - Corporate Campaign.
Finance department - Cash Command.
Computer Services - Statistical Analysis.
- Purpose:** To maintain donor records that will enhance the planning and evaluation of annual campaigns.
- Inputs:** Donor name, address, amount of donation, and any special coding information about the donor. Information obtained from received mail or from receipts books returned from Unit offices.
- Outputs:** Receipts for personal donations. Categorization of data for statistical analysis. Full query abilities on geographic (by Unit), and type (corporate/business, personal/residential, special contacts/events) basis. Produces mailing lists on diskette (forwarded to Microzip, Hill Direct Marketing). Duplicate listings for examination by units. Fundraising report generated monthly showing revenue by type and by region with separate totals for campaign and in-memoriam donations.
- Notes:** Current database size approaching 700,000 records. Bar codes on direct mail not used because keyboard entry found to be quicker. Receipt books filed in boxes for 3 years after entry into the system. In direct mail campaigns, additional names are occasionally purchased from Dominion Directory, known as Prospecting (designated code R in MDAS when a donation is received). Donor database contained in separate files (6 districts + Vancouver City Unit) called companies.

Patient Services

- Hardware:** AS/400
- Software:** Designed in-house, implemented by outside consultants.
- Users:** Patient Services - Financial Aid.
- Purpose:** To track Emergency Aid expenditures that are coded according to fund use, and assigned to Unit expense accounts in the General Ledger.
- Inputs:** An Assessment form is used to collect patient information for monthly batch entry. Issued check stubs indicating appropriate expense categories are batched and entered each month. Approximately 500 checks are issued each month. Data entry consumes roughly 2 full working days per month.
- Outputs:** An Emergency Aid Report provides a break down by Unit of total number of patients and dollar amounts spent over a period. Useful for fundraising activities. A Drug Report is used to determine outstanding amounts expected for reimbursement from Pharmacare via patients and is generally run once per quarter. Reconciliation Reports are used to follow-up where necessary on outstanding assessment forms and check stubs.
- Links:** Tied to the General Ledger (expense information transferred).
- Notes:** Financial need assessed by some 150 local Unit volunteers who issue checks directly. The Financial Aid Coordinator in Division office also does assessments and check issuing.

Inventory Control & Order Entry

- Hardware:** AS/400
- Software:** Canned package customized for CCS use.
- Users:** Administrative Services - Materiel Management.
- Purpose:** To track items in stock and dispersement to District offices. Suggests reorder quantities, and maintains average and latest product cost data.
- Inputs:** Number of items received. Quantities sent to each Districts. Inventory reconciliation adjustments based on year-end physical inventory.
- Outputs:** Month end reports on distribution and total inventory on hand. 'Low' inventory reports. Ad-hoc usage reports for Districts (with date and product number break-downs as requested). End of year reports and summaries, for example, pamphlets used for year broken down by district for Public Education.
- Links:** Tied to the General Ledger (orders paid via expense codes). Updates performed on a monthly basis.
- Notes:** Division departments responsible for producing own purchase orders and indicating appropriate expense codes and dollar amounts. Requests for items received by fax or by mail from Districts. Items delivered once per week, and invoiced for dollar amount. Computer equipment purchasing and inventory accounting done by Computer Services.

Bequests / Planned Giving

- Hardware:** AS/400
- Software:** Designed in-house, implemented by outside consultants.
- Users:** Financial Development - Planned Giving.
Administrative Services - Bequests Administration.
- Purpose:** To aid staff in identifying potential planned giving donors to be contacted via direct mail campaign. Also used to track lawyers and other estate related information like timing of funds.
- Inputs:** Potential donor names garnered from MDAS based on established profile. The system provides more note making capabilities for each individual and better sorting facilities than available in MDAS.
- Outputs:** Mailing lists for direct mail appeals.
- Links:** Linked back to MDAS to allow for queries on individual donor history.
- Notes:** Ensuring confidentiality is very important for this system.

Accounts Payable

- Hardware:** AS/400
- Software:** Canned package customized for CCS use.
- Users:** Finance / Accounting - Accounts Payable.
- Purpose:** To aid staff in the tracking and payment of suppliers invoices.
- Inputs:** Vendor name, address, and amount owing information.
- Outputs:** Checks printed once a week (Wednesday night). Outstanding check report used for reconciliation with bank records. Query can be used to retrieve information for 3 year period (current, last, previous).
- Links:** Tied to the General Ledger (vendors paid via expense codes).

Camp Goodtimes

- Hardware:** AS/400
- Software:** Adapted from MDAS.
- Users:** Patient Services - Childhood Programs.
- Purpose:** To maintain a record of volunteers, councillors, and campers along with the years attended.
- Inputs:** Name and address information.
- Outputs:** Queries on individuals. Lists or labels in preparation for mailings.
- Links:** Part of MDAS library without dollar amount or history information.
- Notes:** The size of the database is relatively small.

Volunteer Registry

- Hardware:** AS/400
- Software:** Adapted from MDAS.
- Users:** District Offices.
- Purpose:** To aid in planning the annual campaign by maintaining a record of previous door-to-door canvassers.
- Inputs:** Canvasser's personal information from Canvasser Kit.
- Outputs:** Lists of canvassers (generally by unit office).
- Links:** Special coding in MDAS database denotes person as a canvasser.
- Notes:** Each program, District and Unit may keep their own lists of volunteers. Records are not kept on all volunteers, rather only on highly active volunteers and canvassers involved in previous door-to-door campaigns.

Video Loans

- Hardware:** AS/400
- Software:** Custom designed database.
- Users:** Public Education.
- Purpose:** To record what videos are in inventory, who has each video and when they are returned.
- Inputs:** Loan information from a release voucher.
- Outputs:** Video status information.
- Links:** None.
- Notes:** The size of the database is relatively small.

Cancer Information Line

- Hardware:** 2 PCs, 1 printer
- Software:** WordPerfect off-the-self word processing package.
ZYINDEX package for document search and retrieval.
- Users:** Used directly by volunteers working the information line.
Overseen by Public Education.
- Purpose:** To enable volunteers to quickly retrieve information in response to caller inquiries.
- Inputs:** Periodic updates of documentation done by Public Education department.
- Outputs:** Results of ZYINDEX searches can be displayed on screen or printed for mail outs.
- Links:** None.
- Notes:** Statistics are kept on the type and number of requests. These statistics are used by Public Education to identify emerging trends in public interest.

Lodge Program

- Hardware:** PC
- Software:** Adapted from MDAS.
- Users:** Vancouver Lodge staff.
- Purpose:** To aid staff in tracking patient stays, calculating bill amounts, and determining room availability.
- Inputs:** Patient demographics, including home address, and type of cancer being treated. Booking information as to the room and bed where a patient, spouse or escort is staying, along with the length of the stay.
- Outputs:** Billing information, room availability, statistics on patient stays such as number of patient stays per year or average length of stays. An activity report that allows for follow-up on outstanding accounts.
- Links:** None.
- Notes:** The Lodge program is only in use at the Vancouver Lodge. The Vancouver Island lodge had a PC at one time, however it was moved elsewhere because it was not being utilized.

APPENDIX D: Data Processing Philosophy (1984)

COMPUTER PROGRAM

Purpose - to increase productivity through mechanization of heavy manual tasks.

Goal

1. To increase the time available for problem solving by decreasing the amount of time expended in communicating information.
2. To increase the independence of major components of the organization through decentralization of record maintenance.

Objectives

1. To establish a system which more than one operator can use at the same time and in which information can be input simultaneously with the processing and generation of data.
2. To replace the present work processing system with a system that can be kept current and that will enable use of state of the art software facilitating secretarial time by including the majority of writing, editing, screen and print formatting features as part of the total information system.
3. To install a system which can utilize with minimum modification the software programs developed and available through the Ontario Division.
4. To establish the following priorities for program implementation and to review these priorities every 6 months.
 1. Terry Fox Run
 2. Fund-raising - Campaign - Corporate
 - Door to door
 - Employee Groups
 - CEO Contracts
 - In Honour Program
 - Special Events
 - Special Contacts
 - In Memoriam Program
 - Bequests and Deferred Gifts
 3. Materiel Management
 4. Accounting
 5. Public Education
 6. Patient Services

5. To purchase hardware which could become universal throughout the CCS which offers longevity, maintenance, support systems and maximum choice of software for fundraising and membership responsibilities.
6. To install a mainframe at the B.C. & Yukon Divisional office with a minimum purchase of 2 terminals initially and the potential of supporting a minimum of 9 terminals in the same location and to install hard disc in 6 districts and "X" unit offices to operate as stand-alones and/or interface with the main computer at Division Office.
7. To establish consultation support either locally or through the Ontario Division consultant.
8. To establish a procedure for program development, preferably together with the Ontario Division which can be used by other components of the organization with the first priority to be Patient Services.

APPENDIX E: Equipment Acquisition Policy (Sept. 1993)

Guiding Principle

As the Canadian Cancer Society is a charitable organization funded by public donation, with service delivery performed primarily by a volunteer work force, an attempt should be made to obtain goods and services as an outright donation or at a reduced rate as a matter of course once a need has identified.

General Procedure for Acquiring Equipment

The following steps should be taken to acquire equipment:

- i Volunteers in conjunction with the District Manager will develop a proposal establishing that the acquisition would make a significant, quantifiable difference to the operation of the Unit or District.
- ii The proposal will be ranked against other request for furniture and equipment in the District by the District Manager in conjunction with senior District volunteers and submitted through the budgeting process.
- iii The proposal will be reviewed by the Administrator, District Services and ranked against requests for furniture and equipment throughout the Division.
- iv The application for funds will be made through the budgeting process.
- v Operating costs will be identified and considered, whether equipment is acquired through the budgeting process or by donation.

Minimum Criteria to Support the Purchase Decision

- i The volunteers who will utilize the equipment on an ongoing basis will be identified.
- ii Ongoing training and hardware and software support will be identified within Unit.
- iii Significant improvement in program delivery will be identified.
- iv Unit office hours of operation will be a least six hours/day, 5 days a week.
- v The proposal will be ranked taking into account Unit Assessment criteria. See Equipment Need Assessment Form, Unit level.
- vi Unit will ensure that the 5% unit cost to revenue criterion is met.

Standard Specifications

It is the objective at the Division and District level to integrate hardware, technical support and training as well as providing software which facilitates database management, spread sheeting, graphics, communication and word processing capabilities.

The Enable Integrated software is the preferred software choice at the District and Division level because of the wide range of capabilities in word processing, spread sheeting, graphics and database management. However, it is not appropriate for Units because of its operational complexity.

Units may acquire WordPerfect and Lotus software and other widely used packages because there is a large pool of trained potential volunteers. Prior to acquiring these other software packages, the District Manager should be informed. Integration between Units and Districts is not possible at this time due to the limited support available to train and trouble shoot.

It is Division policy that all software is licensed.

Support

Due to the limited capability to train and trouble shoot at District and Divisional levels, support can not be provided to Units which acquire equipment.

Maintenance

The Society does not have maintenance contracts for equipment. A maintenance budget is in place for computers which allows for the repair or replacement of equipment, depending on the type of problems and the quality and age of the equipment. This procedure has been found to be more effective than entering into maintenance contracts. When Unit equipment requires maintenance or repairs, it is necessary to get 3 quotes and contact District.

Review of Utilization

Equipment will be transferred between Units if it is found to be under utilized during the annual Unit review and if there is a proven need at another Unit. Level of operating and maintenance cost of equipment will also be considered.

Process to Facilitate the Purchase of Computer Hardware and Software

Following budget approval a District office may elect on its own, or, on a Unit's behalf, to have the Division office procure equipment, or may elect to procure it locally. For computer software and hardware the Division System Manager should be consulted. The following applies to the procurement of products at the local level:

- i The District office will notify the Manager regarding the product requirements of the District or Unit.
- ii The Manager will advise the District Office regarding the product which should be procured and an approximate cost if purchased.
- iii The Manager will determine the best overall package based upon price, maintenance, shipping, local support, group purchase savings, etc.

Unit Considerations When Planning for Computer Acquisition

As hardware and software support is not available from District or Division, the Unit should consider the following:

- i Establishing working relationships with local suppliers who have a commitment to provide ongoing hardware and software support.
- ii Acquiring a system which has software loaded and is ready to go.
- iii Choosing software which is commonplace and user friendly so that trained volunteers and local training is available.
- iv The solving of problems with computer applications should be carefully considered. In some Units where computerization was seen as the solution to many problems, it has resulted in greater difficulties in training, program development, etc.

APPENDIX F: Background for IS Challenges

This appendix discusses some of the reasons behind the recent large scale purchase of PCs for the Division office. It also summarizes some of the researcher's impressions of differences in user knowledge about and satisfaction with the current information systems based on the interviews conducted during the organizational overview phase of the project. Finally, observations concerning control over decision making related to IS resources are presented.

Bulk PC Acquisition - Division Office

Until very recently the hardware at the Division office consisted of an IBM AS/400 minicomputer which ran most of the significant applications, and eight personal computers that served a variety of purposes. See Appendix C for detailed descriptions of the existing custom applications. The AS/400 provides the large database capabilities needed for the MDAS and the GL, and ensures a high level of security. However, current applications have used up the majority of the existing disk capacity, performance in terms of cursor return and printing has been slow on occasion, and the available personal productivity tools for the AS/400 have less than optimal functionality and interfaces. In recognition of these limitations, the Division office has acquired additional PCs for individuals who require access to the AS/400, and have demonstrated a need for personal productivity applications, such as word-processing. This action will help alleviate the capacity, performance, and functionality concerns. Other benefits should include increased productivity, reduced training costs, greater convenience for those working outside normal office hours, and independence if the AS/400 goes down. One area of concern that the acquisition of PCs in the Division office does not directly address is that of the time required to develop new or enhance existing custom applications. Requirements analysis, design, programming, testing, and debugging all take considerable time and effort in comparison to simply purchasing off-the-shelf software, but produce tailor fitted functionality. This trade-off requires that the long-term costs and benefits of each avenue be considered and debated before funds are committed.

User Knowledge & Satisfaction

Judging from the comments made during interviews, the administrative and management levels of the organization generally appear more satisfied with the existing systems than the support staff. It is not entirely clear why these differences exist, although some staff pointed out that many of the administrators do not use the systems directly, and therefore may not have experienced any frustrations that have either existed in past or continue to exist today. However, the recent acquisition of PCs as described above may alleviate these differences. There are also important differences in how individuals think about IS in the Division, which seems to correspond to levels of experience with PCs. As could be expected, less experienced users tended not to have formed a well considered opinion in regard to their satisfaction with current systems, and had difficulty conceptualizing how IS could improve their productivity. The more experienced users generally appeared prepared to discuss opportunities for improvement, and had higher expectations about the potential of IT to contribute in a meaningful way.

Location of Decision Making Control

All IS departments must deal with the desire to control purchasing and enforce standards that reflect priorities and ensure compatibility, while attempting to satisfy the immediate and specific needs of user departments. This tension is most obvious at the Division in how information and IS resources are obtained by District and Unit offices. Most of the organizational information is processed and stored at the Division office, which in effect means the Division office has control over that information. As well, the acquisition of PC hardware or software is normally done through the budgeting process, which means that approval is dependent upon Divisional priorities that may or may not correspond with those of the requesting District or Unit office. This situation potentially brings with it a certain amount of frustration and desire for more control on the part of Districts or Units who feel that the control should be placed in their hands.

APPENDIX G: Client-Server Computing

Introduction

A number of key advances in IT have combined to make client-server computing an attractive alternative for many organizations. Modern microprocessors have driven the price / performance ratio to the point where computers have become a commodity. This in turn has enabled the almost factory like production of software that has varied functionality and is easy to use. As well, networking technologies have now progressed to the point where a myriad of different machines can work together and share resources. Client-server computing promises many things including increased flexibility from the modular nature of the network nodes, more usability since any available network resource can respond to a user request, and better integration through the linking of formerly disparate systems.

Definition

Client-server computing is a form of cooperative processing where the work performed for an application is split between individual computers on a network (Maurer & Silver 1993). At least one of the computers is a programmable workstation (PWS), such as a PC or RISC machine, that does more than simple terminal emulation (Gartner Group 1994). Client-server computing is often talked about in relation to down-sizing and open systems. Down-sizing in the IS sense refers to moving applications to smaller computers where the cost per unit of work is lower, and does not imply a need for client-server. Open systems is a set of non-vendor specific protocol and program interface standards proposed by neutral standards setting bodies. It is these standards that facilitate client-server computing, however, open system in itself does not equate to client-server (Maurer & Silver).

Motivation

There are many good reasons for organizations to move toward client-server computing. One major driver is the increased usability provided to the end user by an intuitive and familiar graphical user interface (GUI) running on a PWS that provides a single point of access to corporate databases and processing resources (I/S Analyzer 1993). Users are relieved from having to know where information is physically stored and from learning the command line syntax required to access the platform where the data resides (I/S Analyzer 1992). This usability translates into improved productivity as a result of such intangibles as higher user satisfaction, better access to information, and greater flexibility. Additional reasons for moving to client-server are that standards are maturing, familiarity with the technology is improving, and almost all new advances in IS may soon be in the client-server domain (Maurer & Silver 1993). Overall, these forces allow organizations to integrate their computing environment and broaden their options with regards to product selection.

Costs

It is important to realize that the benefits of client-server accrue to end users and that operating costs may in fact be greater, particularly in the short run. Converting to client-server requires considerable user and technical training, and is often slowed by numerous technological difficulties in establishing the base network and getting applications to work properly (I/S Analyzer 1993). Both the organization as a whole and the data processing department must be adequately prepared for the adoption process if these obstacles are to be overcome. Linking the future system to business goals and understanding the technology are important first steps (Maurer & Silver 1993). The benefits of a successful transition are elevated user productivity with the possibility of lower long term costs.

Management Issues

Client-server computing in itself does little to add value to the organization. The real potential comes from the integration of client-server, IS planning and enterprise planning, where client-server can be used as a tool that enables significant change in the operation of the organization (Gartner Group 1994, Maurer & Silver 1993). Client-server provides new opportunities for reengineering processes that could not be considered with traditional technologies. By first ensuring that organizational processes are designed to provide the right data to the right people, then carefully planning and managing the transition, the move to a client-server platform should prove extremely beneficial for many organizations.