South Western Nova Scotia
District Health Authorities
Information Systems Strategic Plan

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In partial fulfillment of the requirements of the Master of Health Informatics Program,
Dalhousie University

Report of Internship for the period May 10 – August 27, 2004
Date Submitted October 04, 2004

Acknowledgement and Endorsement

Peter Hoyle has written this internship report in partial fulfillment of the requirements for the Master of Health Informatics Program at Dalhousie University. This report has not received any previous academic credit at Dalhousie University or any other institution. The "Information System Strategic Plan" document that was submitted to the District Health Authorities is included to provide more detail. Some of the text from this document is used in the Internship report where appropriate.

I would like to thank the departmental representatives from the district health authorities as well as Dan Goodwin Director of Information Services and Ms. Jackie MacDonald of Library Services. I would also like to thank the executive teams of the three districts for allowing the department representatives to take the time to provide the information gathered.

Dr. Shepherd clarified over a telephone conversation with Peter Hoyle that the analysis of the strategic plan itself could constitute the critical analysis and problem solution section of the report. Rather than investigating in detail one particular problem for a health informatics solution the investigation and analysis took the form of many smaller investigations.

Executive Summary

The internship placement reported to the Director of Information Services for the three District Health Authorities of South Western Nova Scotia. The objective was to construct a five-year information systems strategic plan for all departments in the Annapolis Valley, South Shore and South West Nova District Health Authorities. The districts support three regional hospital facilities, eight smaller health and hospital facilities and a number of clinics and public health offices.

The internship work was performed from May 10 to August 27, 2004. The author's role was to define, plan and complete the project of collecting the information and assembling the strategic plan. The majority of the information gathered was through interviewing over ninety departmental representatives in thirty different departments across the three districts. Information from External organizations such as the Department of Health was also gathered. The information was synthesized into themes that became the basis for the strategic plan.

The strategic plan was comprised of a summary of current and future initiatives within clinical, administrative and infrastructural areas. The initiatives covered operational areas from engineering maintenance through human resources to financial and materials management. The clinical aspect covered areas such as acute care services, rehabilitation, addictions and public health. The infrastructure initiatives dealt with the computer and network building blocks needed to implement all the initiatives.

The internship proved to be a valuable learning experience for the author and provided exposure to the operations and clinical functions of acute care facilities as well as community and public health services. The direction of the strategy follows the strategy of the provincial department of health toward provincial hospital systems and is only the very beginning of the strategy building and implementing process.

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1 Introduction

The internship objective was to build a strategic plan for the information systems in the district health authorities of southwestern Nova Scotia. The internship reported to the director of Information Services and constituted gathering of future initiatives regarding computer systems across all departments in the health authorities. The internship required the understanding and investigation of information needs and process functions of clinical areas as well as administrative areas. The clinical areas provided exposure to the application of information systems in the medical and health context with elements such as charting, diagnostic testing and medication administration. The administrative areas provided exposure to the operations functions and taught the information flow and systems involved in operating a sustainable healthcare facility or district.

The Information Services department is a shared service between the three district health authorities of Southwestern Nova Scotia. The Strategic plan was to cover all of the departments in each of the three districts as well as those services shared between the districts. The districts operate eleven hospitals and provide services for acute care as well as a number of community and public health services.

The majority of the information gathered was through interviews of department representatives throughout the districts and facilities. There were more than 90 representatives interviewed in over 30 different departments across the three districts. Synthesizing the information gathered involved categorizing the initiatives and projects into common themes under the major areas of Administrative, Clinical and Infrastructure.

The strategic plan is a summary of the projects and initiatives for information systems in the three districts and represents a start to the strategic planning process and subsequent execution of that plan and strategy.

2 Description of the Organization

The district health authorities are governmental organizations that support acute care services as well as other clinical and public health services for their specific region.

The three district health authorities of South Western Nova Scotia are Annapolis Valley District Health Authority, South Shore District Health Authority and the South West Nova District Health Authority. They were formerly one region and consequently share a number of services, Information Services being one such service. The information systems strategic plan project was directed through the Information Services department and the internship position reported to the Director of the service. The Information Services department manages the support, maintenance and implementation of computer systems, library services and telecommunications for the three districts.

The three health districts support 3 regional hospital facilities, 8 smaller health and hospital facilities and a number of clinics and public health offices. The districts are organized with a high level organization as follows:

Annapolis Valley Executive: Chief Executive Officer, VP Acute Care, VP Operations, VP Community Health, and VP Medical.

South Shore Executive: Chief Executive Officer, VP Clinical, , Medical Director, VP Community Health and VP Operations.

South West Executive: Chief Executive Officer, VP Operations, VP Clinical Care, VP Community Health, and District Chief of Staff.

The executive team in each district has the following departments reporting to them; however the reporting structure to particular executives varies between districts.:

Risk Management	OR/Day Surgery
Infection Control	Emergency/ambulatory

Maternal Child
Medical Unit
Oncology
Intensive Care Unit
Sterilization Processing Department
Lab
Pharmacy
Diagnostic Imaging
Rehabilitation
Mental Health
Respiratory
Palliative Care
Primary Care
Social Work
Food and Nutrition
Plant Engineering
Environmental Services
Health Records
Site Administration
Clinical Engineering

The following services are shared amongst the three districts:

Material Management
Information Services
Finance
Addiction Services
Public Health
Human Resources

3 Work Performed for the internship

.3.1 Description and Role

The Internship's objective was to gather information on and build an "Information Systems Strategic Plan" for the three district health authorities (accompanying document). This plan would be a summary of the current, upcoming and future projects and initiatives throughout all the department areas in the three districts and the shared services. The information gathering process largely consisted of identifying and interviewing the department managers and representatives to collect current and future initiatives.

The role of the author in this internship was to define the process for gathering the information, build the project plan, execute the tasks to complete the project plan, as well as synthesize and present the information.

The information system strategic plan itself concentrated on providing a summary of the projects and initiatives related to computerized information systems. The

project did not concentrate on manual process information flow other than to identify areas of planned future computerization. The project did not perform a needs analysis or investigate the type of knowledge and information required for professional development, training and research other than to identify systems to help facilitate the management of this information.

.3.2 Project, Process and Plan

The steps of the process undertaken to gather and aggregate the information for the strategic plan are as follows:

1. The first step was to define the project and build a project plan. The high level project outline and plan document called "Information System Strategic Plan Overview" and a sample status report accompany this document.

2. The second step involved presenting the project and identifying the area representatives. The presentation to management of the project and plan was divided into four distinct groups South Western, Annapolis Valley, South Shore and Shared Services.

   The project was presented to the South West executive team and the list of areas and directors was validated. Subsequently the directors were consulted and the area representatives identified.

   The project was presented in the Annapolis Valley Region to the Acute Care portfolio group, the Operations portfolio group and the Community Health portfolio group. The Acute Care discussion groups and representatives were identified after the portfolio meeting. The area representatives for the Operations and community health were identified at the portfolio meetings.

   The project was presented to the South Shore executive and the area representatives were subsequently identified.

The Shared Services directors identified the Shared Services area representatives.

3. The third step was to introduce the project to all the area representatives through email, and schedule some of their time to meet and collect the information.

4. The fourth step was to meet with the area representatives either on the phone or in person and collect information regarding the following questions

   - Current systems in use in the area,
   - Current projects in progress related to information systems affecting the area.
   - Potential projects not yet started relating to information systems.
   - Future vision of information systems in the area and
   - Opportunities for improvement

   The notes from the discussions with the area representatives were recorded in a template and emailed to the area representative for validation. The templates were then updated with any additions or modifications.

5. The fifth step was to identify the schedules and scope for the major department of health initiatives. This information was gathered and is included in the plan.

6. Step six involved identifying common themes and initiatives from the notes and discussions. The Current Projects and the Potential Projects were collected into theme categories and presented in a spreadsheet format. The future vision statements

from the representatives were aggregated and categorized and were presented in a second spreadsheet.

7. Step seven constructed and presented the strategic plan from the information. The plan represents a list of projects and initiatives against a timeline where timelines are available.

.3.3 Aggregation of Information and Summarization

More than ninety representatives were interviewed in over thirty different departments across the three districts. The information gathered through the interviews was aggregated into spreadsheets. Two spreadsheets were put together, one that categorized and listed all the projects and one that listed all the concepts for future systems improvements and applications. The concepts list comprised 576 statements classified into similar themes. The projects list consisted of 150 projects classified into themes, status and origin. These spread sheets proved useful in referencing and synthesizing the information.

4 The Relationship with Health Informatics

The internship concentrated on gathering information about the initiatives related to computerized systems throughout the departments of the District Health Authorities both in the hospitals and the community health areas. This work involved gaining an understanding into the interdepartmental information and process requirements for both clinical and administrative functions. The relationship of the computer applications with the information, functionality and process flow relates well to Health Informatics.

The internship work required research on the part of the author to gain an understanding of the process and information flow of the departmental functions. This research was conducted through discussions with department representatives and through program and application websites. These investigations included clinical, administration and infrastructural areas.

The investigations were generally superficial since there were so many departments to understand. One such investigation was to determine the boundaries that the Meditech software would have with the automation of information in the operating theaters and instrument sterilization-processing department.

The Operating Room Information system would need to provide the functionality of managing an electronic list of instruments required per physician-procedure and to be capable of adjusting the instrument and consumable kits required for the day's surgery electronically. The author concluded that the Meditech system was not suitably detailed to manage the integrated needs of scheduling the operating procedures nor the tracking and kitting of instruments. The departmental representatives confirmed this conclusion indicating that a separate Operating Room Information system integrated with Meditech would be one possible solution.

5 The Strategic Plan, Problem and Solution.

The district health authorities are relatively complex organizations in that they provide several services across multiple facilities separated geographically. The complexity is increased when more than one District Health authority is involved. The information requirements across the organizations also tend to reflect this complexity. The information systems initiatives have many driving forces and this can lead to duplication of systems and integration problems. The Information Management Accreditation review carried out in the districts made an observation that a multiyear strategic plan would be helpful in directing the initiatives towards a common end.

The problem presented itself as the need for an overall view and summarization of the current and future initiatives as they relate to the goals of the organization.

.5.1 Aggregating and Synthesizing the Information

The aggregation involved collecting the information into a spreadsheet format that could be easily sorted and referenced. Specifically there were two spreadsheets created, a projects list and a list of future ideas. The statements and project descriptions were entered into the spreadsheets with the origin identified.

The information was then scanned manually for common themes and then categorized by theme. Two levels of themes were used, one more detailed than the other; the less detailed set of themes became the structure for the strategic plan.

.5.2 Providing a plan

The start to a solution for an overall plan or strategy was to aggregate the initiatives and plans for information systems into a draft strategic plan. The Information Systems Strategic Plan serves as a summary of the current and future initiatives for information systems within the three district health authorities of southwestern Nova Scotia. This plan covers information processes and flow related to computer systems rather than manual systems and will contribute to the Information Management Strategic Plan. This plan is included as an attached document at the end of this report.

The main source for compiling the plan involved a process of interviewing the department managers and representatives throughout the districts gathering current and potential initiatives. Other sources included internal documents as well as department of health representatives and documentation.

The fundamental strategy is to follow the provincial initiatives and to encourage provincial solutions for the gaps in these initiatives. There are provincial and national initiatives as well as those shared between the districts and those specific to districts. The time lines are high-level estimations. Detailed implementation plans will follow as the initiatives are approved and become projects.

The initiatives and strategies were categorized into three main groups Clinical, Administrative and Infrastructural. These categories were then subdivided as shown in the next few sections.

.5.2.1 Clinical Initiatives

Hospital Information Systems

This area covers systems specific to hospital functions such as food and nutrition, admitting, laboratory systems, operating room scheduling, pharmacy and an electronic medical record.

The general strategy is to follow the provincial initiatives for hospital information systems and to encourage provincial solutions for the gaps in these initiatives. The strategy is to use the Meditech software as the primary solution and venture elsewhere only when Meditech does not meet the needs.

Some gaps in the hospital information systems implementation are as follows: a food and nutrition system, a cardiac information system, an operating room information system, and an emergency department information system.

The systems should be integrated in a manner that reduces and eliminates, where possible, duplicate information. The systems should also feed statistical information into a common interface for analysis and reporting.

Charting

This area covers the systems enabling patient charting such as the patient care module for Meditech.

The general view is to move towards electronic charting as much as possible without undue disruption of the workflow. The challenge is the interface for the collection of information, primarily the data input and wireless infrastructure required. The electronic elements of the chart would provide simultaneous access to the information from many locations.

Case Management, Service Scheduling and Community Health

This area covers initiatives related to community case management including public health and addictions. Scheduling outpatient visits to facilities is also included here.

The strategy for community patients visited outside the facilities is to implement and use the provincial systems and look to Meditech if there is no provincial system. The strategy for outpatients is to schedule and record charting information for all patient visits to all services in district facilities using the Meditech software.

Clinical Equipment and Automation

This area covers systems related to automation such as unit dose machines and robotics for pharmacy, Diagnostic Imaging systems and clinical equipment maintenance systems.

The general direction is to support the implementation and integration of clinical equipment with the information systems. For example, the direction should be to ensure that Diagnostic Imaging equipment purchased is compatible with the existing PACS and Meditech infrastructure.

.5.2.2 Administrative Initiatives

Document Management and Reference Information

This area covers the publishing of documents electronically, such as policies, procedures and training material for both staff and patients. Initiatives for internet and intranet design and publication would be included here.

The consensus is to pursue a strategy to organize online research and reference material and implement processes, tools and infrastructures that manage electronic documents. The audience for this documentation would include specific

patient situations, the community and the district staff. Electronic training material, policies and procedures are examples of these initiatives.

Human Resources Information Systems

This area covers recruitment, education and retention initiatives as well as staff scheduling and other human resources systems.

The strategy is to bridge the gap from now until a provincial Human Resources information system is implemented. The goal of the bridge would improve integration, automation and sustainability of current information systems. This would be a valuable stepping-stone towards the provincial direction in the future.

Administrative and Analytical Systems

This area covers finance, materials management, preventative maintenance, project management, as well as analysis and reporting of information.

The general strategy is to follow the provincial initiatives for administrative systems and to encourage provincial solutions for the gaps in these initiatives. The analytical and reporting strategy is to pursue a common reporting and analysis interface for all systems and to follow the provincial initiatives into data warehousing for hospital operational information. The provincial initiative for Finance and Materials Management using the "SAP" system would be integrated with other systems.

.5.2.3 Infrastructure:

The objective for the infrastructure strategy is to put in place the building blocks required to maintain and grow the existing systems and those targeted for the future.

The strategy includes the following initiatives:

- Evolve the network to facilitate improvements such as, reducing the number of passwords required, automated distribution and maintenance of software, remote help desk support, remote access to applications and enabling the use of barcode technology.

- Plan and implement a wireless infrastructure throughout the district facilities.

- Establish processes to manage and control the wireless frequency spectrum from clinical monitoring devices through wireless routers between facilities.

The initiatives outlined in the Information Systems Strategic Plan are one possible direction for the information systems to take in the next few years. A standard methodology for project management and a targeted approach to training and work flow process change will help with information systems projects in the future.

6 Conclusions

The information gathered throughout the discussions with departmental representatives and reviewing organizational documents lead to a number of observations as follows:

- The provincial Department of Health strategy is a primary driver of the district health authority information systems direction. There are several of reasons for this, such as the goal for province wide interoperable systems, the dynamics of funding and economies of scale.

- The majority of the resources and effort to implement the initiatives such as the SAP Finance and Materials management systems or the Hospital Information Systems will be business or clinical process resources engaged in system configuration, process integration and training. There is a move

towards more centrally managed applications on a provincial basis. Information technology resources to support these will be outside the district health authorities.

- Projects in the organizations are well run; however there is not a standard methodology across the departments. The information services steering committee is at the beginning stages of their methodology and should be a valuable tool in managing the evolution of information systems.

- The increased use of electronic information and computer applications in the day-to-day process of the District Health Authorities is inevitable. The challenges this change represents are well known to the District Health Authorities and will represent a significant part of the effort in future system implementation.

- The continued immediate need for information has spawned numerous electronic information systems initiatives within departments. These departmental systems although very useful have led to duplication of systems and information. The strategic plan and the Information Services steering committee will help effectively direct the servicing of the information needs.

7 Recommendations

This Information Systems Strategic Plan serves as a summary of initiatives relating to information systems and is simply a starting point. The directions and plans for the district health authorities are very much driven by the provincial and federal funding and initiatives. Therefore the strategic plan must be a dynamic document that can adapt to the changes in focus by the organizations involved.

The following are a few points to investigate for the future.

The incorporation of a Common Standard project framework or methodology across the organization could be investigated. The project framework could include collaborative tools for electronic sharing of information and reporting.

Physicians were a group that was not well included in the information gathering process and in the future should be better included.

The initiatives relating to education training and professional development are combined under human resources information systems and the document management themes. This topic of knowledge is very important and although this strategy addresses primarily the electronic tools rather than the knowledge itself, this theme or topic deserves a separate category in future plans.

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9 Appendices

There are three accompanying documents

- The “Information Systems Strategic Plan 2005-2009” for the District Health Authorities of South Western Nova Scotia, which was submitted as the strategic plan.
- The “Information System Strategic Plan Overview” a short overview presented to the area representatives and the executive teams of the district health authorities.
- A sample Project status report used in tracking and presenting the progress of the project.