

CRITICAL CARE INFORMATION SYSTEM (CCIS)

Recipient of Public Service Quality Award of Merit, 2007

INDUSTRY



Healthcare

BUSINESS VALUE



ICUs now receive more bed space or staff to accommodate increasing numbers of patients – based on real-time resource utilization data;

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ICU beds are more likely to be allocated to those most in need, as all areas of the Critical Care Strategy work together more efficiently as a system;

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Patient safety and care is increased, as the Ministry is able to obtain an integrated view of each aspect of the Critical Care Strategy. As a result, the Ministry can determine where more training is required, what units require more resources and which life-saving interventions are most effective;

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Public safety and care is increased, as the Ministry can now better respond to crisis situations through improved surge planning (e.g. province-wide health epidemics).

CCIS is fulfilling the Ministry’s vision of improved adult critical care for all of Ontario’s citizens. CCIS aggregates distributed, raw data and transforms it into useful, meaningful knowledge, supporting key decision-makers in the Ministry to optimally serve critical care units across the province. Improved business intelligence is driving business value for the Ministry and translating into better healthcare for all.



The Client

The Ministry of Health and Long-term Care selected University Health Network (UHN) to oversee the development and implementation of the Critical Care Information System (CCIS). UHN was responsible for overall project management and selected Navantis as their technology partner and systems integrator.

The Situation

The Ministry of Health and Long-term Care makes all funding and resource allocation decisions for hospitals (and their critical care units) across the province. In order to make the most informed decisions, they require complete hospital and patient information in a timely, easy-to-use fashion. Historically, the hospitals collected and compiled their own data about patients and resources, leaving the Ministry to rely on incomplete, non-standardized information. Because each location used its own reporting methods, there was no easy way to aggregate the disparate information in order to support strategic funding and investment decisions.

Ontario’s Ministry of Health and Long-term Care announced a \$90M mandate to improve critical care across the province. As an important part of this initiative, Navantis developed a *comprehensive business intelligence solution* to connect the intensive care units of 120 hospitals across Ontario to the Ministry. The development of CCIS resulted in improved *critical care service and access*, through better resource allocation, capacity planning and management.

SOLUTION APPROACH

- Use of proven technologies from Microsoft and Cognos to minimize risk and maximize ability to integrate with various hospital information systems
- Rapid development to meet aggressive time lines
- Balance between agility and control
- Microsoft Identity Integration Server
- Cognos 8 BI
- WebTrends Analytics 8

TECHNOLOGIES USED

- Microsoft Windows Server 2003 (Enterprise Edition)
- .NET Framework 2.0 with ASP.NET and Visual Studio .NET
- M-Tech ID-Synch and P-Synch
- Microsoft Internet Security and Acceleration (ISA) Server 2004
- Microsoft BizTalk Server 2006
- Microsoft SQL Server 2005 (Enterprise Edition)
- Microsoft Active Directory Services
- Microsoft Operations Manager

The Approach

Navantis' challenge was to meet the business needs of the client while ensuring compliance with accessibility, security and legislative requirements. There were many key stakeholders vested in the successful development of CCIS, and Navantis had the experience and expertise to satisfy all interests.

In order to meet the project's aggressive timelines, Navantis applied agile software development principles coupled with strong project planning, risk and change management processes. There were several key success factors which led to the project's completion on-time and on-budget:

- Iterative process deployed, with project evaluation at the end of each iteration;
- Strong complement of specialist partners, including Dapasoft, Microsoft Consulting Services and Courtyard Group;
- On-site client workspace provided at Navantis, facilitating face-to-face communication and consensus-building;
- SharePoint site developed for document and project management, with key stakeholders having access to shared information; and
- Weekly team meetings and frequent steering committee meetings scheduled in order to update project status, share information and make decisions as required.

The Solution

The Critical Care Information System collects data from adult intensive care units (ICUs) across the province of Ontario. Data collected includes medical and surgical ICU information, admission diagnosis, patient demographics, Critical Care Response Team intervention status, life support interventions and bed availability. This aggregated data, collected from all hospital locations, is then optimized for business intelligence reporting. The information is available for retrieval and analysis by stakeholders at all levels, including hospital, LHIN (Local Health Integration Network) and regional administration, and the Ministry.

Navantis, a Microsoft Gold Certified Partner, designed and implemented the CCIS solution using key Microsoft technologies including the .NET Framework, Microsoft SQL Server 2005, Microsoft BizTalk Server 2006 and Microsoft Windows Server 2003.

CCIS receives real-time HL7 message transmissions from each hospital's Admit, Discharge, Transfer (ADT) system. (CCIS supports HL7 versions 2.4, 2.5 and 3.0.) These transmissions include patient demographic and admission information. Navantis also built a data-entry portal using Microsoft ASP.NET and SQL Server 2005, allowing ward clerks to enter additional patient information using a series of web forms.

This aggregated information is optimized for reporting using MS SQL Server 2005. The COGNOS 8BI business intelligence platform is used to provide standardized reports and real-time interactive data analysis services.

Single sign-on is provided by Active Directory Federation Services and Microsoft Identity Integration Server.

The Results

CCIS provides comprehensive insight into all aspects of the province's Critical Care Strategy by aggregating data regarding patient information and critical care details. Because the information is normalized and consistent for each participating hospital, the Ministry can accurately track ICU trends, identify anomalies and flag resource allocation issues.

Since solution roll-out began in January 2007, user adoption has exceeded expectations. Data quality and data entry compliance continues to meet and surpass projected goals every month, owing to the solution's intuitive interfaces and processes, and overall ease of use. This means that CCIS can perform in the way it was intended, as it accurately captures and stores the data required to create meaningful information.

The Ministry of Health and Long-Term Care now has the knowledge it requires to make informed decisions about resource and funding allocation for individual critical care units across the province.

About Navantis

Navantis is an award winning provider of complex IT solutions development and systems integration. With a focus on custom development, Navantis offers solutions for SAP and Microsoft Interoperability, Enterprise Content Management, Business Process Management, Collaboration, and Business Intelligence. Through our comprehensive range of services including consulting, custom development, application support and maintenance, quality assurance and IT outsourcing customers have been able to increase productivity and profitability through the use of technology.

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