District health board improves patient services with business intelligence solutions from HP and Microsoft

Capital & Coast District Health Board achieves improved business analytics and reporting capabilities and reduces costs by 50 percent

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Jonathan Jourdain, Director, Decision Support & Clinical Information, Capital & Coast District Health Board

HP customer case study
Microsoft® SQL Server Fast Track Data Warehouse for HP and the HP Business Decision Appliance provide better access to data that helps improve patient care

Industry
Government/ healthcare

Objective

Provide a central repository for business data that uses proven, reliable design and automation to deliver advanced analytics rapidly

Approach

Create a Quality Center of Excellence to standardize testing processes across the enterprise; implement automated testing and report generation technology

IT improvements

- Created standards for BI analysis and reporting to ensure faster access to data
- Standalone BI environment provides more control and is easier to manage
- Improve performance of data warehouse and BI systems by 50 percent
- Save two months managing solution by implementing reference architectures and appliances
- Reduce number of licenses required by 50 percent by consolidating on one platform

Business benefits

- Important business intelligence data readily available from one source
- Experienced 50 percent cost savings versus previous solution upgrade
- Increased confidence in data helps to drive better patient care

How to keep 300,000 people healthy

Keeping a large population healthy is no small feat. Consider a day in the life of Capital & Coast District Health Board (C&C DHB) in Wellington, New Zealand, for example. Over 150 patients are admitted to its hospitals. Its general practitioners and primary health care nurses see 3,226 patients. Fifty-five people undergo surgery. Hospital laboratories perform 1,100 laboratory tests. Community pharmacies fill 5,400 prescriptions. Eleven new babies are born. More than 675 medical records are processed.

At the hospitals and clinics that are part of C&C DHB, all of this and more happens, day in and day out. For the 298,000 people who live in its district, C&C DHB assesses the health status of the population and determines what funds should be directed to preventing illness and to early intervention of illness via primary health and public health services. It employs about 3,500 full-time employees, with an additional 1,500 part-time staff.

Constantly monitoring the health of the organization

Because C&C DHB relies on government funding to help improve and protect the health of its community, it must collect and assimilate large amounts of data into reports regarding three major areas of the organization's operations. C&C DHB must track all patient activity, such as the mix of patients seen at clinics and hospitals, the complexity of patients'

illnesses, and the length of hospital stays. It also collects operational data from clinics and hospitals to provide daily feedback on the demands for patient care and to audit clinical activity for areas that need improvement. Finally, the DHB must provide information about key performance indicators (KPIs) to the National Ministry of Health to show how it is achieving health targets for its district population.

Clinics and specialty services use approximately 45 different systems to track patient data that the health board uses to create reports for the Ministry of Health and for its own executives. Data from these systems are stored primarily in eight different source database platforms, depending on the vendor requirements for the software. To collect data from the source databases for business intelligence (BI) reporting and analysis, C&C DHB used an operational data store running on several versions of Microsoft SQL Server. "The data store was built over time by different developers, so we had no consistent method for collecting data," explains Jonathan Jourdain, director of decision support and clinical information at C&C DHB. "We had a report engine running on top of that to create reports, but the data we pushed out to users was static. We had no interactive solution." Linking queries to multiple systems was difficult, and in some cases data was entirely inaccessible.

The first cure isn't always the best cure

C&C DHB realized it needed a true data warehouse and BI solution to help it do the following:

- Unlock clinical information that was difficult to access due to vendor support policies, software licensing, or contention of system resources
- Integrate information from multiple subsystems that are physically separated and built on different platforms to make them accessible in one place for reporting and analysis
- Provide a single source for housing core data to ensure the organization had an accurate view of all data
- Provide accurate data for better planning to help drive limited funding to the most important areas

The predecessor organizational unit prior to the Decision Support Unit (DSU) being formed considered solutions from several vendors and eventually decided to purchase a solution from SAP. Although there were some good SAP solution capabilities, the solution was complex and the DSU's small development team required a lot of diverse training and experience to use it. The team deployed several pilots in a virtualized environment and experienced performance issues, primarily because the solution had to share a storage area network (SAN) with other clinical systems running in the same environment. The ICT team was also concerned about the performance impact on the clinical systems it supported. "We spent a lot of time dealing with infrastructure issues, instead of

doing actual data warehouse development to improve our BI benefits," says Brian Lee, Technical Leader – Business Intelligence Development at C&C DHB.

Purchasing additional SAN storage to support the SAP solution and improve performance for running it in production was not an option. "We're under severe financial pressure, which is typical in the health system," says Jourdain. "We needed a data warehouse and BI solution that would match the DSU team's skill set and ability to access talent, and would also meet our budget constraints. That's when we decided to consolidate on Microsoft and HP."

Providing the key to wellness

C&C DHB deployed the Microsoft SQL Server Fast Track Data Warehouse, a reference architecture created collaboratively between Microsoft and HP using pre-tested hardware and data warehousing best practices to optimize Microsoft SQL data warehouses. The SQL Server Fast Track Data Warehouse consists of Microsoft SQL Server 2008 R2 Enterprise Edition along with add-on Analysis Services and Reporting Services technologies. The solution runs on HP Converged Infrastructure technologies, integrated and optimized to work together to provide an efficient resource pool. C&C DHB deployed an HP ProLiant DL380 server, along with an HP D2700 MSA disk enclosure populated with eight 300 GB 10k SAS drives to store data. Everything is connected together by an HP Networking E2510G-24 Switch.

> **"With the reference architecture developed by HP and Microsoft, we have peace of mind that the solutions will work."**
> Brian Lee, Technical Leader – Business Intelligence Development, Capital & Coast District Health Board

To provide a BI single source for key stakeholders, C&C DHB also deployed the HP Business Decision Appliance, which is pre-configured and includes HP support all optimized on an HP ProLiant DL360 server with internal storage and SQL Server along with Microsoft Windows® Server 2008 R2 and Microsoft SharePoint 2010.

The DSU worked with the ICT team to build a new, non-virtualized BI infrastructure where it could deploy the new solutions to ensure performance. "With the data warehouse reference architecture and the BI appliance developed by HP and Microsoft, we have peace of mind that the solutions will work," says Lee. "We didn't need to do things like performance or load testing. We minimized all that effort."

Increased confidence in data drives better patient care

Because the DSU team's developers are familiar with a Microsoft environment, they were quickly able to begin transitioning data and reporting to the new solutions. They also set up automation and reporting frameworks to help uncover data faster. Jourdain says, "Using the BI framework we created with the HP and Microsoft solutions, we can advance patient care by improving how we monitor our efforts to treat and manage patients more effectively."

Using SharePoint Integrated mode, C&C DHB produced dashboards using PerformancePoint Services for SharePoint. Using the dashboards, clinicians and quality leaders can easily monitor clinical process improvement initiatives that lead directly to improved care for patients. The organization can also track critical funding information. "Our commercial managers have near real-time information on how our activities align with our funding requirements, and therefore get better alerts to service demand issues emerging," says Jourdain.

Provides a "one-stop shop" that's easy to manage

With a small team of only 20 people, the DSU team saved considerable time and effort by implementing the SQL Server Fast Track Data Warehouse and HP Business Decision Appliance. Not only did it consolidate the hardware and software components required to run its data warehouse and BI solutions, but it also created its own standalone environment isolated from the organization's other applications. The ICT team manages the hardware, and the DSU team manages everything else. "By putting in a Microsoft and HP reference architecture, we save a lot of time because it's very clear what we manage and what ICT manages," says Jourdain. "We have control, so we can implement our strategy faster. Having the ability to host all our services and content in one place is also a major win for us."

Increased BI capabilities at 50 percent reduced cost

By implementing the SQL Server Fast Track Data Warehouse and the HP Business Decision Appliance, C&C DHB reduced costs significantly. Besides avoiding the cost of upgrades and licensing consolidation for its SAP solution, the organization also avoided the cost of purchasing more hardware to run the SAP solution in its own environment. "The cost of the Microsoft and HP solutions was approximately half the cost for renewing our SAP suite of products," says Jourdain. "We didn't even get the same capabilities in the SAP suite—no equivalent existed in our SAP suite for the collaboration platform that comes with SharePoint."

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Increased performance means better access to the latest data

By deploying a BI environment that is designed and optimized for BI, the DSU team can guarantee better performance for its data warehouse and BI solutions. The architectures solve a crucial data warehouse challenge: significantly improve hardware and software performance. The number of computing cores, I/O channels, and storage arrays in the architectures are matched to maximize CPU throughput. The combinations take advantage of all the hardware components in equilibrium, without underutilizing or overburdening any one component. "With the SQL Server Fast Track Data Warehouse, ETL takes less than 30 minutes, and our hourly delta processes only take a few minutes," says Lee. "People can access data more quickly, and they can produce reports faster."

Provides a model for other health organizations

C&C DHB has found that other health organizations throughout New Zealand are taking notice of its improved reporting capabilities. "We've been visited by other organizations that are keen to use some of our in-house frameworks for delivering content, managing metadata, and the development lifecycle," says Jourdain. "Ultimately we are looking at collaborating with our peer District Health Boards and agencies to make the benefits of our platform more shared and sustainable in a harsh financial climate."

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