HealthManagement
Promoting Management and Leadership

Volume 2 / Issue 2 2007 - Management

Modernising St. Olav's Hospital

Author

JRaønb erg-Larsen

Senior Key Account Manager,

Telenor Nordic.

In an ambitious two-phase project, the new 220,000 m2 St. Olav's Hospital is being built on the site of the existing hospital near downtown Trondheim, Norway. Telenor was chosen as the main supplier of ICT infrastructure and integration services. The Osloand US NASDAQ-listed company is one of the world's fastest growing providers of mobile communications services (with over 115 million subscribers) and the largest provider of TV services in the Nordic region. For the St. Olav's project, Telenor adopted an integrated approach to ICT infrastructure solutions.

Accommodating New Patient-Centric Vision

The vision for the new hospital is 'Building for Health'. It aims at making the physical and services infrastructure

of the hospital reflect the centrality of patients in the scheme of things. St. Olav's will be Norway's first hospital to

be based on individual patient rooms (organised in clusters called 'Sengetun'). St. Olav's will also be an integrated hospital, with equal rights to accommodation for patients and their relatives, healthcare and service personnel,students, teachers and researchers. Last but not least: the new hospital is also designed to be a model forhealthcare in the region, in Norway and internationally.

As part of this vision, ICT solutions at the hospital will have to serve three main purposes: patient care, research and education. In turn, this implies that ICT solutions must integrate different user environments: the hospital itself (with its variety of user groups and needs) as well as the Medical Faculty at the Norwegian University of Science and Technology (NTNU). To ensure close cooperation between treatment/care and education/research needs, ICT solutions

have to feature strict security requirements.

Demands on ICT

The Hospital Development Project for Central Norway has specified the following ICT objectives:

î Efficient and secure communication access: Ease of access by staff to ICT solutions need to be accompanied

by equivalent attention to security, making information accessible only to authorized personnel.

î Increased availability – always fast access: ICT systems availability is required to be 99.999%, putting extremely high demands on the design of the ICT solution, in particular the data network.

î Increased digital interaction and communication: Medical records will have to be stored electronically and made available for medical staff where and when required. The hospital will not be paper-free, but paper use will be minimised.

î Always up-to-date patient information: As part of its patient-centric focus, patient information will be continuously updated, and effected by medical staff from PCs, from patient terminals as well as through mobile units.

î Everything over IP, IP everywhere: All data and voice communication will require to run on the same IPnetwork.

An Easier Work-Day with Wireless Technology

Wireless data-and telephony is available throughout St. Olav's hospital, indoors and outdoors. The staff is provided

wireless IP-phones, used for both voice and messaging services. There are plans for providing medical staff with

tablet PCs or PDAs for medical use(MDA – Medical Digital Assistant),which would be used for ordering medicines, lab tests or X-Rays and scans.

Alongside, there also are plans to use the MDA as a telephone, pager and for message services. The wireless network

will give access to the patient care journal and to wireless IP-phones everywhere in the hospital, except specially sensitive areas.

The extensive use of wireless technology is aimed at providing hospital employees with a more efficient workday, freeing up time for patient treatment and care.

Surveys by The Gartner Group indicate that hospital staff with patient contact can save 30-90 minutes per day through the use of wireless systems. Even more conservative estimates of 10 minutes a day translate into large efficiency gains.

However, these figures have yet to be confirmed since the new hospital has been in operation for less than a year.

Telenor's Role

As the principal ICT infrastructure contractor, Telenor is responsible for both design and implementation of the solution at St. Olav's. This includes:

î Total responsibility for systems integration, interface coordination and design and implementation of a totally functional ICT infrastructure.

î All cabling and network electronics, wireless networks, patient signal, IP-telephony, security (logon/authentication) solutions.

î Patient terminals, wireless IPphones, portable and stationary PCs, alarm and positioning system, central equipment for TV-distribution, AV-equipment as well as other peripheral equipment.

Telenor's partners deliver their components for the ICT solution and take part in solution design and project administration. However, Telenor has overall responsibility for the ICT contract with regard to functionality, quality, delivery and profitability. In other words, it is responsible for ensuring the interoperability of all components, and the functioning of the solution according to customer expectations.

Ideas that Simplify

The new St. Olav's hospital provides patients with individual rooms. Aside each bed is a patient terminal which can

be used as a phone, TV or radio. Eventually, it may also be possible to use it to order food and control lighting. On their part, doctors can use the terminal to access and update the patient's medical journal from the bedside. If security regulations permit, patients too may access their own medical journal.

All employees are issued their own multifunctional smart card with a digital signature. This is used for logon/authentication for PCs, as a non-contact admittance card, as a credit card in staff restaurants, to permit withdrawal of staff uniforms from dispensers, to print documents, to sign for blood tests and for identification at pneumatic dispatch stations.

State of the Art Communities

The communications systems are the most modern in any Norwegian hospital and hosted on the same IP-based network. This, of course, puts very high demand on network capacity and quality. A flexible, portable profile is the key

element in the Telenor solution. Screen displays are automatically transferred to fixed or wireless IP-phones. The phones themselves are programmable, with a soft-phone solution available as an option. The phones may also be used for paging. At a later stage, this solution is also primed to enable exchange of screen displays and for integration with calendar/email and other data systems.

Fast and Secure Alarm Call System

An alarm call system is also part of the ICT solution at St. Olav's Hospital.

When an incident occurs and an employee needs assistance, he or she can press a pre-set button on the fixed or wireless IP-phones to set off an alarm. The ICT system routes the alarm to the appropriate person or persons, based on its nature and location.

Though much emphasis has been put into making the phone alarm capabilitiesm a simple feature, it is based on a

complicated technological solution whose key components also comprise a message server handling messages

according to predefined rules, an identity management system with coverage of all employees, and their roles and

responsibilities, as well as a patient signalling system.

Technological Challenges: Security and Future-Proofing

Several different institutions are using the Telenor ICT solution. Apart from St. Olav's Hospital itself, these include the Medical Faculty at the Norwegian University of Science and Technology (NTNU), South Trøndelag Regional College and the Central Norway Regional Health Authority.

Concerns in such a context about data security have been answered in the shape of a Network Security Architecture and authentication solution, which will give St. Olav's Hospital strict access control to the ICT solution.

The solution delivered in Phase I is designed to have a long life time, and will be the basis for the Phase II solution due for delivery by end 2009. Much effort has therefore been put into making the solution future-oriented and flexible, in order to accommodate forthcoming developments in technology.

The ICT solution at St. Olav's consists of several different elements functioning as one solution with regard to implementation and operation. In order to make this possible, a huge effort has been put during development into identifying and coordinating a large number of interfaces between the various elements. These are interfaces both inside the ICT infrastructure and interfaces with systems such as the central control and monitoring system, pneumatic dispatch system, electro systems, lift systems etc...

In Phase 1 alone, approximately 120 various interfaces were identified.

Lessons Learned

The main challenge when implementing new ICT solutions at organizations such as hospitals – where the key focus

is patient care – is to find enough time for staff training. At St. Olav's, each employee has on average received 2.5 hours of formal education. This was augmented by having on-site support personnel available during the transitional process. Another lesson learned is that there should be greater focus on organisational development alongside ICT, and more information to employees (since new solutions have to be sold to the employees). Also, we believe in the need to focus more on individual departments prior to implementation.

Technically, there were problems in the first 3 months with wireless phones; these will be replaced with new units. There are still some hardware problems. There have also been some breakdowns with the alarm systems as well as one major breakdown of the network in June last year.

On the whole, however, these problems are not more than could be expected when implementing such a complex ICT solution.

St. Olav's Hospital

St. Olav's Hospital is centrally located in Trondheim, Central Norway. It employs 8,170 people and treats 413,000 patients a year. The new St. Olav's Hospital, being built atop the older one, is among the largest building projects in Norway. It is also, by far, the most ambitious ICT project in the region. By the time it opens for business in its new incarnation, the project would have entailed investments of over NOK 11 billion.

The first phase lasted from autumn 2003 to August 2006. The second, now ongoing, is due to be completed in 2014. More than 80% of the existing hospital (100,000 m2 will be demolished), while the hospital is in full operation.The new hospital will have a distributed layout consisting of a number of separate centres, creating special requirements for ICT solutions with regard to mobility and flexibility. In addition, locations for some facilities such as the Psychiatric Centre have not yet been decided (a challenge in its own right for the ICT infrastructure).

In February 2004, Telenor and its partners were awarded the ICT infrastructure contract for Phase 1, followed in December 2005 by a three-year contract for its operation. In January 2007, Telenor and its partners won the contract for delivery of the ICT infrastructure for Phase 2. The total value of the contracts is in the region of 1 billion NOK (112.5 million Euros).

Published on : Mon, 31 Dec 2007