Cyprus Ministry of Health improves hospital services with IBM and SAP

Nicosia Hospital is one of the key healthcare organizations serving both inpatients and outpatients on the island of Cyprus. The hospital handles almost 40 percent of the total annual admissions on the island and employs 2,170 people, of whom 300 are doctors and 860 are nurses. In 2010, Nicosia Hospital treated 23,000 inpatients and 291,000 outpatients, and conducted 7,000 surgical procedures.

For example, one in four laboratory tests was delayed or lost due to missing paperwork. Frequently, doctors would re-order tests several times while waiting for results, and there was no easy or convenient way to check whether there were already valid results on file for each patient.

Poor visibility of inventory levels led to personnel ordering incorrect types or amounts of medical consumables, leading to wastage – for example, when medications expired before they could be used.

By improving control and automating administrative processes and by introducing electronic patient records, the Ministry aimed to reduce costs while also improving the quality of care for patients. The objective was also to reduce waiting times for treatment and to improve working conditions for staff.

Overview

Challenge
The Cyprus Ministry of Health wanted to increase the effectiveness of its annual healthcare spending for Nicosia General Hospital and Famagusta General Hospital.

Solution
A team of IBM and SAP engineers implemented the Integrated Healthcare Information System (IHCIS) – a comprehensive integrated solution incorporating the SAP for Healthcare solution portfolio and based on IBM expertise in systems integration and innovative technology.

Key benefits
By reducing paper-based processes and improving inventory visibility, the hospitals have saved an estimated €10 million per year.
To improve efficiency both at Nicosia Hospital and at Famagusta Hospital, another major hospital on the island, the Cyprus Ministry of Health launched the Integrated Healthcare Information System (IHCIS) project, one of the largest IT healthcare solutions in Cyprus.

The key goal of the IHCIS project was the full integration of the clinical, administrative and financial activities of the Nicosia and Famagusta hospitals, improving the quality of patient care and facilitating more efficient and effective use of the national healthcare budget. To do so, the aim was to fully automate patient medical records and hospital workflows, allowing clinicians, consultants and managers rapid access to vital medical information, and improving the agility, transparency and accountability of healthcare services.

Starting treatment
“The strategic business imperatives behind the IHCIS project are very clear,” comments Elli Yiapatou, IT Manager, Nicosia Hospital. “We were aiming to create a single integrated solution to support the clinical, administrative and financial activities of both hospitals, including a full electronic patient record accessible to medical staff directly at the point of care. In combination with paperless business processes and automated workflows, this would allow us to deliver the right information at the right time to the right people – and to protect patient data in a secure and manageable way.

“The combination of IBM Global Business Services consulting and technical skills, supported by the IBM System x server technologies, helped us to build an integrated and effective solution combining both SAP and non-SAP applications that is dramatically improving our ability to offer effective and efficient healthcare to the people of Cyprus.”

Elli Yiapatou
IT Manager
Nicosia Hospital
“A key area was transactional processes: we aimed to enable seamless transactions that would connect patients, providers and pharmaceutical companies to reduce overall costs, accelerate payments and improve healthcare delivery.”

To realize its vision of a modern, streamlined healthcare management system, the Cyprus Ministry of Health worked with consultants and engineers from SAP® and IBM® Global Business Services® to implement the IHCIS project. The key component is the SAP for Healthcare solution portfolio, selected following a long and detailed RFP exercise conducted by the Cyprus Government.

“The SAP for Healthcare solution was selected as one of the leading global ERP systems and because of its ability to integrate with the other elements in the IHCIS project,” recalls Elli Yiapatou. “SAP software met all of the functional and budgetary requirements. IBM was chosen as the lead implementation partner following a similar technical and financial evaluation. We also recognized that IBM had a good local presence and was able to demonstrate similar reference projects for other government clients.”

Holistic therapy

Both the IBM and SAP teams were faced with significant challenges to achieve the Ministry’s goals. In addition to building an IT platform from the ground up, IBM and SAP engineers developed a functional solution covering 13 application areas and serving more than 1,300 medical and administrative personnel across both Nicosia and Famagusta hospitals.

IBM Global Business Services played a key role in the overall solution, providing consulting services, implementation and technical services, project management, training, operational support, maintenance services and helpdesk services.

“There was literally no integrated system before, and no process automation whatsoever, so it was important to get input from users on how they wanted the new system to work,” explains Elli Yiapatou.

“Working with IBM, we created a pilot version of the IHCIS with minimal customization, and asked users to provide feedback. We also asked them to re-evaluate the original requirements from the RFP, which were potentially several years out of date.”

Solution

The Ministry engaged IBM and SAP to implement the Integrated Healthcare Information System (IHCIS) – one of the largest healthcare IT projects in Cyprus.

The solution combines the SAP for Healthcare Solution Portfolio running on high-performance IBM System x servers with other applications to integrate clinical, administrative and financial activities at both hospitals.
Once all of the feedback was collated, IBM created a revised blueprint for the solution, and then ran through the analysis, design, build, customization, testing and user acceptance phases. Further refinements are being made as usage of the solution grows and as additional feedback and requests for new functionality are received.

“We ran a phased rollout to enable users to become comfortable with each new area of functionality,” says Eli Yiapatou. “The first stage saw the release of the patient registration and outpatient billing systems. We allowed these to run for six months before releasing the inpatient module. It was really important to give staff time to get used to the new ways of working: the biggest challenges with this project were based on human rather than technical factors.

“IBM Global Business Services continues to provide extensive support around change management and training, and they have also played a major role in re-engineering our business processes to make them more uniform and better suited to automation.”

“IBM continues to transfer SAP skills to our team, and we already run the internal helpdesk for ourselves. We are now actively working to create departmental experts to act as advocates and trainers for the solution.”

Solid basis
The integrated SAP applications (SAP FI/CO and IS-H) manage the billing, accounting and financial costing of all hospital processes. SAP also manages hospital stock control (drugs and medical consumables) (SAP MM) and personnel administration (SAP HR). Other functional areas (including patient administration and laboratory and prescriptions services) are based on non-SAP solutions.

Because the management of thousands of confidential medical records is a key element in the project, the solution was designed with in-built
data security and redundancy to ensure that vital data would be protected from loss or misuse.

To provide the necessary performance that the full solution required, the joint team installed a number of IBM System x® servers, including IBM System x3950, x3650 and x3550 servers. The System x servers use efficient and powerful Intel Xeon processors, and combine high levels of reliability with easy management.

“The IBM servers have worked perfectly since deployment – we are fully satisfied with them,” states Elli Yiapatou. “Many of the key IT administration and user management tools are from IBM, and they are also working very well. The IBM Tivoli landscape helps us to ensure excellent service availability at all times.”

Data backup is managed by IBM Tivoli® Storage Manager software. The IHCIS is also supported by IBM Tivoli Monitoring, IBM Tivoli Endpoint Manager, IBM Tivoli Remote Control, IBM Tivoli NetView® and IBM Tivoli Service Request Manager®. Tivoli Monitoring enables the hospitals to monitor the performance and availability of the IHCIS solution, while Tivoli Endpoint Manager helps keep critical systems patched, updated and free of security issues, as well as enabling the remote distribution and update of software packages. Tivoli NetView complements these technologies by providing full discovery and troubleshooting for the distributed network. By monitoring network health and gathering performance data, it supports rapid and accurate identification of the root causes of network failures.

Tivoli Service Request Manager provides ticketing, tracking and monitoring tools for helpdesk staff, enabling them to efficiently manage and prioritize support requests from users, while Tivoli Remote Control allows them to take control of a user’s PC to fix problems.

Healthier outlook

Today, almost every aspect of healthcare at Nicosia and Famagusta hospitals is managed by the IHCIS – from patient records to personnel management.

Physicians order tests via an electronic form, which tracks the progress of the test from the receipt of the specimen by the laboratory technicians to the release of the results to the doctor. By eliminating the relatively slow and
unreliable paper-based processes that frequently caused test results to be lost and required tests to be duplicated, the hospitals are together saving an estimated €8 million per year.

“In the past, it could take weeks or even months for results to reach the correct person in the correct department, so it was very common for tests to be re-ordered multiple times for the same patient. With the new electronic patient record managed by the IHCIS solution, outpatient clinics can immediately see the results from blood tests, as well as the full history of tests for each patient,” remarks Elli Yiapatou.

“Now, everything is streamlined and completely visible, so there are no longer any delays or unnecessary repeat instructions. Physicians in the local clinics have told us that they are extremely happy with the electronic patient record, which has given them a much more comprehensive and accurate view of each patient.”

The Picture Archiving and Communications System (PACS) in Nicosia General hospital is linked to the IHCIS solution, managing each stage of the radiology process electronically. Diagnostic X-rays are scheduled via an electronic planner. After the scans have taken place, the reports are available to doctors via the patient’s Electronic Health Record, greatly increasing the efficiency of the diagnostic process, and reducing the amount of radiological film required each year by 75 percent. By switching from a manual to an electronic process in this way, the hospitals are jointly saving €1 million each year – funds which can be reallocated to improve other aspects of hospital services.

Full control over stocks
Additional savings have been made by improving the hospitals’ inventory management. Following the solution implementation, every product is requested, ordered and catalogued with the SAP Stock Control solution.

As hospital employees now have full visibility of stock levels and order histories, they can ensure that they re-order the correct amount of the right products, reducing wastage resulting from expired products, for total savings estimated at more than €1 million per year.

“Just before the solution go-live, we carried out a full stock-count in the warehouse, and we found that many items had expired – representing around €1 million of stock,” notes Elli
Yiapatou. “The SAP Stock Control solution, installed in all Cyprus hospitals as well as the two that have the full SAP solution, gives us complete visibility and control, and will help us to massively reduce loss and wastage over time.”

Better stock control also means faster pharmacy services and less waiting time for the disbursement of drugs. When a doctor needs to prescribe a drug, he or she can see a full list of available drugs and stock levels. With a clear view of stock levels both in the central pharmacy and on the wards, there is much less chance of over- or under-ordering, and less risk of running short of life-saving drugs.

**Automated efficiency**

With many previously manual processes now automated thanks to the IBM and SAP solution, the Cyprus Ministry of Health is increasing spending transparency, efficiency and accountability across both Nicosia Hospital and Famagusta Hospital. The current plan calls for the IHCIS to be rolled out to all public hospitals by 2017.

For most procedures and services at Nicosia Hospital, billing is automated, and patients can quickly and easily settle their bills. In the past, patients would have to visit the point of service, request the cost information, and return to the main office to make the appropriate payment.

“We don’t yet have costing structures for every service, but the technology is all in place and we’re ready to fully automate the billing process as soon as the government decides on a uniform scale of charges for all services,” says Elli Yiapatou.

The introduction of e-services for registration and for doctor’s appointments is expected to make it faster and easier for citizens of Cyprus to access the medical services they require. The introduction of a common electronic healthcare record across all public hospitals will make it easier for healthcare professionals to provide the right treatment in a timely fashion.

“With the IHCIS powered by IBM and SAP technologies, doctors can now see the complete history of each patient on their laptops as they do their ward rounds,” comments Elli Yiapatou. “This saves a significant amount of time and effort, and it allows them to make fast, well-informed treatment decisions when dealing with critically ill patients.”

Hospital administration is also much more efficient and transparent with the
new IBM and SAP IHCIS solution. For example, nurse managers can view and analyze bed occupancy and staff workload on the wards, and use this information to create staffing rosters. On a broader scale, staff at the Ministry of Health can monitor the balance between inpatients and outpatients, track rises or falls in demands for particular kinds of services, and plan future investments on this basis.

“Moving from a manual system to an integrated healthcare information system has transformed and improved the majority of processes used in the hospital,” concludes Elli Yiapatou.

“We have already seen significant benefits in terms of time and cost savings, and these will multiply as the system grows and as users gain confidence. The combination of IBM Global Business Services consulting and technical skills, supported by the IBM System x server technologies, helped us to build an integrated and effective solution combining both SAP and non-SAP applications that is dramatically improving our ability to offer effective and efficient healthcare to the people of Cyprus.”