



CSW Group Ltd makes Case Notes, a fully scalable software suite for health records management and one of the leading products in its field. Major National Health Service sites deploying Case Notes include the Oxford Radcliffe Hospitals NHS Trust; the Wrighton, Wigan and Leigh NHS Trust; the Doncaster and South Humber Healthcare NHS Trust; and the South Staffordshire Health Authority. Founded as CSW Informatics in 1989, the present CSW Group (including other subsidiaries CSW Health and CSW Online) was listed in the Sunday Times TechTrack 100 in 2002 as one of the fastest-growing technology companies in the UK. The company is privately held and is based in Oxford.

Case Notes includes the ability to define sophisticated access control policies, which are stored along with its other data in a Microsoft SQL Server database. Recently, however, UK government departments have become keen to move towards open standards based on XML, making XACML (eXtensible Access Control Markup Language) the new standard for expressing and querying access control policies. XACML, an OASIS specification, is an XML language for describing access control requirements for online resources. Designed to be applicable to diverse situations, it is intended to allow efficient machine parsing of arbitrarily complex security policies.

CSW decided to make Case Notes XACML-compliant, and in February 2004 they approached Parthenon for help. Parthenon Computing already had extensive experience with XACML, and the company produces its own suite of XACML software products, which are written in C++.

Parthenon's task was to create a standalone tool which could read from the Case Notes database into XML files and also reverse the process to recreate tables in the database. Because not all the data in the database could be expressed in XACML, Parthenon also had to design a new XML format in which to store the non-XACML data.

Java was chosen as the working language of the new tool, because of its sophisticated facilities for processing XML, including the Xerces-J parser library from the Apache Project. Parthenon's engineers also chose to base part of the program on modified code from Sun's open source Java XACML implementation, saving a significant amount of development time.

Parthenon understands the importance of thorough testing and quality assurance. In addition to their own unit tests, Parthenon implemented integration tests based around test data provided by CSW. Later in the contract, testing was carried out on-site at CSW's office by Parthenon engineers.

Parthenon worked out a carefully estimated schedule for completing the work on time and was able to adhere to this as far as the initial specification was concerned. However, towards the end of the project new scalability requirements were introduced and these necessitated extra time to complete the work.

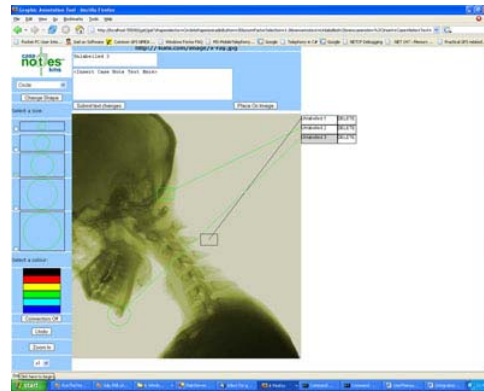
After the project was completed, CSW solicited Parthenon's help in another project, connected to the NHS's "Spine" system. One component of the Spine is the Spine Directory Service (SDS), an LDAP directory containing data about NHS staff, organisations and business services. Parthenon's brief was to produce, from sample data, a working LDAP directory for CSW to use for testing their own software.

The sample data was provided in spreadsheets, and an important part of the

work was devising a mapping from the spreadsheet format onto the SDS directory structure. The rest of the task involved creating scripts (mainly in Perl) to import the spreadsheet data into LDAP and configuring the LDAP server.

Building on the success of this project, CSW soon contracted Parthenon to design and implement a system which would allow medical professionals to access and annotate medical images via a web page.

Whilst the system had to allow users to 'draw' over the medical images, in order to annotate them, technologies such as JavaScript, Flash or Java applets were unsuitable because of security restrictions and the heterogeneity of client platforms.



Parthenon's engineers soon devised a system which allowed users to add lines, shapes and text to an image via a standard html form generated by a J2EE servlet. To allow optimum performance, the annotations were produced as a much smaller separate image, and then overlaid at the client so as to allow the page to refresh in response to user input more rapidly.

The lines and shapes comprising each annotation were stored as as SVG (a W3C standard which defines how one may represent vector graphics in XML). As before, a thorough suite of unit tests was devised and integrated with Parthenon's automated build-tester, thus ensuring that the application was delivered on schedule, passing all CSW's acceptance tests first time.

John Chelsom, Managing Director of CSW, says *“Without the help of Parthenon, we would not have been able to reach our development targets. They have an exceptional team of engineers, and their approach has enabled us to deliver high quality innovative software to our clients in a very short space of time. There is*

*no doubt in my mind that, with the right partner, outsourcing development can deliver true value to any business.”*

To discuss how we can add value to your business:

**Contact Graham Innocent on 01865 811184.**

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