TELEMEDICINE ON THE GRID

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Key words to describe the work: Medical Application, Access Grid, NHS, Advanced Collaborative Environment

Key Objectives: To bring the Advance Collaborative Environment of Access Grid Technology into the NHS clinical domain.

Motivation for the work (problems addressed): This joint project between the University of Cambridge and the West Anglia Cancer Network will demonstrate the capability of Grid technology to improve the delivery of patient care in the West Anglia region and potentially throughout the National Health Service.

Overview

The West Anglia Cancer Network (WACN) provides cancer services for a core population of 1.6 million and has an extended catchment area of 2-4 million. The Cancer Centre for the network is based at Addenbrooke's Hospital in collaboration with Papworth Hospital for patients with lung cancer. Six more Cancer Units at Bedford, King's Lynn, Peterborough, Hinchingbrooke, West Suffolk and Harlow Hospitals, together with the Cancer Centre at Addenbrookes, serve the remainder of the region.

Industrial support for this project is kindly supplied by Siemens Medical Solutions, the University of Cambridge Department of Radiology and Macmillan Cancer Relief.

Aims of the Pilot

It is clearly desirable to provide care as near as possible to the patient's home. Continuity of care is also maintained for patients who require treatment at the Cancer Centre (e.g. for radiotherapy) as their treatment is planned by the same Consultant they have seen at their nearest Cancer Unit.

Clinicians are currently travelling large distances to provide remote clinical
services, this project will investigate the use of technology to prevent such travel and provide access to appropriate clinical information and medical images across the network.

**Technology**

By introducing an advanced collaborative environment comprising secure video, voice and data services, we will be able to bring clinicians together to share expertise and improve patient care by allowing virtual collaborations across these widely dispersed clinical teams.

Specifically, the project will provide a secure infrastructure to support multi-disciplinary team meetings for the review of cancer diagnoses and treatment by delivering:

- multi-site videoconferencing
- interactive collaboration using radiology and pathology images
- mining of appropriate cancer datasets

The initial prototype videoconference model currently runs over circuit-switched ISDN in seven of the WACN hospitals.

This allows the NHS to experience an effectively plug and play system with on-demand, value added services without the requirement for specialist node operators.

Clinicians are able to access a variety of medical applications and peripheral devices that facilitate qualitative discussions at MDT meetings. Digital imaging technology is available at all meetings, with access to MRI and CT scans. Pathologists are also provided with histopathology data.

It is also hoped to demonstrate the feasibility of remote access to computational medical simulations and the mining of patient record databases to improve the clinical decision making processes within specific disease groups.

**Wider benefits**

Bringing an advance collaborative environment into the NHS will primarily give clinicians the technology and facilities to extend best practice throughout their individual disciplines.

In line with the NHS Cancer Plan, introducing multi-disciplinary team working will improve patient management and long-term outcomes, as well as raising clinical standards.

It is also envisaged that a considerable saving of expensive clinical time can be rapidly achieved.
Multidisciplinary team meetings will benefit from the collaborative technologies that the Grid can provide. Such collaborative technologies will be a benefit to every discipline in the medical arena, allowing the sharing of expertise on a national and global level. This application of Grid technology will not only enhance existing clinical practices but has real potential in the education and ongoing development of all clinical personnel.

**Clinical Usage**

The project has been running and providing operational support for multi-disciplinary team meetings for the past 18 months. Cancer disease groups already using the system are Gynaecological, Upper GI, Lymphoma, Dermatology, Urology and Testis.

The remaining 18 months of the project will focus on content within MDTs and the continued rollout to additional disease groups. A phased implementation of existing hospital resources will also be undertaken. This will include existing clinical databases as well as collaborative projects such as JCIS, the Joint Clinical Information System.

**Future Developments**

More recently the Telemedicine project successfully bid for 100k from the East of England Development Agency to install a virtual private network.

This virtual private network will provide a secure infrastructure for four of the sites in the West Anglia region to connect over IP, and so reduce the revenue burden of an ISDN connection.

Cambridge eScience have also been approached to manage the installation of a similar model to WACN in some of the neighbouring cancer networks.

Other cancer networks will benefit from 18 months of project management experience in this area as well as the specialist training for their clinical staff and IT support teams.