

**Title of Project:** GIMI (generic infrastructure for medical informatics)

**Principal Investigator:** Andrew Simpson

**Aim(s) of Project:** Breakthroughs in medical informatics have yielded a wealth of data across all aspects of patient care. The development of a product-level, generic, dependable and secure infrastructure that interfaces with technological solutions deployed within the NHS via what might be termed an "ethical firewall" (i.e., in accordance with legal and ethical guidelines) would provide a world-class medical informatics resource. Such a resource would be able to support research into evidence-based patient-centred care, facilitate on-demand decision support for practitioners, and act as a test-bed for UK-based SMEs in the healthcare arena. A grid service consortium led by IBM (UK) and the University of Oxford will develop a service-based infrastructure that adapts and extends the e-DiaMoND platform, leverages deliverables from the wider e-Science community and interfaces with NHS IT.

**Please provide a summary of the project proposal (max 1 page):** We will develop a system that allows the aggregation of data from a large number of resources to provide an archive for commercial and academic research: to support clinical trials, to train algorithms, to facilitate healthcare monitoring and self-management, and to serve as a training resource. The impact of this resource will be significant: for UK-based SMEs in the healthcare arena, clinical researchers, and healthcare professionals. The project requires innovative computer science and e-Science solutions, practical implementation, and a clear approach to issues of patient consent and confidentiality.

e-DiaMoND - like similar systems - sits outside the NHS firewall receiving data from a bespoke service. GIMI, in building upon e-DiaMoND, will address four key technical areas: genericity, interoperability, dependability and security. Each area represents a technical challenge, frames a key deliverable, and presents benefits.

e-DiaMoND was designed with extensibility in mind. To ensure that GIMI is sufficiently generic will require the use of ontologies developed by related projects.

Interoperability is important for several reasons. First, the platform will receive data from and pass information to other clinical systems (with PACS systems being particularly relevant). Interfacing with the new NHS spine is key as GIMI is intended to dovetail with the proposed NHS spine and provide secure access to ethically acquired data. Second, it is desirable that the platform to be capable of interfacing with many different pieces of equipment: it is essential that the developed platform is compliant with relevant OSI standards such as DICOM, IHE and HL7. In addition, the project will need to be aware of standards and delivery schedules being proposed for the NHS Spine, PACS deployment, etc. Finally, integration with initiatives such as the NCRI Informatics Initiative will be essential to garner support from the relevant clinical and research communities.

The e-DiaMoND platform has been designed to be dependable: the architecture was designed with the needs of the nearly 100 breast care units in mind. To consider the needs not just of the Breast Screening Programme, but the national healthcare arena, significant effort will have to be expended to ensure that the system passes scalability and usability thresholds. Along with manageability, scalability will be key with respect to dependability and IBM's lead in this area will be essential.

The final key development challenge is security. The e-DiaMoND team has recently developed a vision for secure grid-enabled healthcare within the UK and this will be the basis of the security architecture for GIMI.

At the end of this three-year technology transfer project we will deliver a grid connecting three hospitals, interfacing with currently deployed technology, receiving ethics-compliant data from such systems and permitting services to access data in a secure fashion: through what might be termed an 'ethical firewall'. In particular, the database will be a repository for information pertaining to tens of thousands of patients suffering from chronic conditions.

**Please list 3 deliverables that the project will contribute to the UK and/or international cancer informatics community:** An ethical approach to enabling interoperability of research archives with the NHS; a secure infrastructure for health grids; an infrastructure to support the evaluation of new technologies, products, and extensions.

**Please describe how the project will incorporate and/or reuse existing informatics infrastructure and/or resources. If the project will not use any existing infrastructure or resources (e.g. data standards or ontologies) please explain why this is the case.** The project will adapt the e-DiaMoND infrastructure, and make use – where appropriate – of, for example, standards and ontologies developed within first generation projects. In addition, the team members will track IT developments within the NHS over the duration of the project.

**Please describe the plans for the sharing of data and dissemination of knowledge that arise from the project:** There will be six-monthly workshops, and we will seek the help of DTI-funded Knowledge Transfer Networks and the intermediation of SEEDA's Bio-Pharma and Healthcare sector and other sector networks. The representation of the MRC, the NCRI and the Department of Health on the project's advisory board will also aid in this respect.