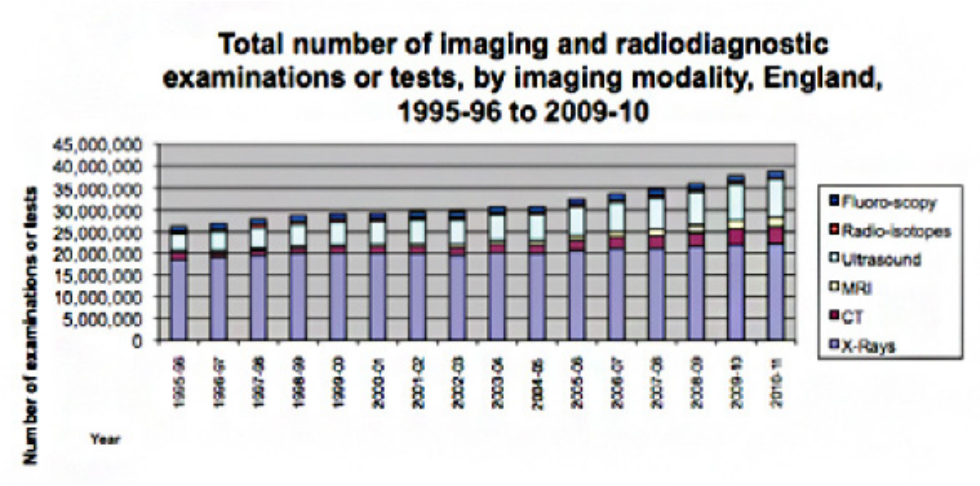
Data storage in the NHS

In its 2012 Healthcare Technology trends to watch, Ovum cited Electronic Health Records and Digital Imaging, including PACS (Picture and Archiving Communications Systems) as the top 2 healthcare IT investment priorities for 2012. It states "As Institutions adopt healthcare IT, a rising flood of digitised data is being collected and stored". As the UK population increases and the proportion of elderly increase as a percentage of the population, there is an increase in the prevalence of long term health conditions - all pointing to an increased future requirement for healthcare provision and therefore a rise in patient data generated. Anders Ynnerman, Scientific visualization expert from the Gothenburg University, made the explosion of medical data very clear when he explained that that the CT scan of yesteryear which used to deliver approximately 50MB of data, taking about 100 slices of a human body now takes over 24,000 pictorial image slices of the same body, delivering 20GB of data. He stated that thanks to advancing technology the same 5 second scan will imminently produce a file of approximately one terabyte of data. These figures are per patient, per data set and the use of such imaging tests for diagnostic purposes in the modern NHS is growing steadily.



Source: Imaging and radiodiagnostics, NHS organisations in England.

A single view of the patient

As the government continues to push for more integrated and joined up care through many initiatives including the provision of electronic patient records, so NHS Trusts are looking to implement electronic record systems which can join up to PACS systems as well as historic digitised patient notes to deliver a single, electronic view of the patient. The momentum of growing electronic data storage therefore continues to gather pace with only recently the HSJ featuring an article suggesting that *"The NHS Commissioning Board is "likely" to mandate new a set of standards for clinical and social care records in a push to increase efficiency"*.

"The prediction, from the Department of Health's (DH) National Clinical Director for Informatics Charles Gutteridge, came as a working group commissioned by the DH called for a new body to be established to develop health record standards".

The group's report said *"computers require standardisation of data if they are not to create chaos"*, and pointed out that improving the transfer of information between NHS bodies would cut incidents of *"avoidable harm"* to patients. Dr Gutteridge told HSJ that information could only flow more freely if standard formats for electronic patient records were agreed and adhered to.

In addition to the increase in clinical and patient data, there is also a plethora of business and management information that will need to be digitally collected and analysed for the governments Payment by Results initiative, historic patient notes to be digitised, a rise in genetic modelling data and medical testing data not to mention data generated from an increasing prevalence of self-monitoring tele-health and telemedicine solutions that are being deployed to encourage patients to be involved in their care and help reduce some of the cost burden of providing care from the NHS.

The overwhelming volume of patient records

So what defined a record? NHS Connecting for Health (CfH) defines a record as a record of each and every one of an organisations activities including health records, X-rays, administrative records, photographs, slides and other images, microfilm, audio and video tapes, cassettes, CD-ROMs, diaries, E-mails, text messages and on and on. According to the Department of Health Records Management: NHS Code of Practice Guidance, these routine records, which are stored in patient notes have to be kept for eight years for an average patient, but with an increase in litigation and medical trials it is not uncommon to keep notes for more like 25-30 years.

One hospital trust, who recently signed a large deal to digitise their patient records rather than build another store to house the paper versions estimates they have between 200M to 300M individual pieces of paper to digitise and catalogue and the number of records they generate continues to grow at between 40,000 to 50,000 a year. Multiply these figures by the number of current UK Trusts and it is easy to see how the Healthcare Sector is suffering from an explosion of electronic data.

Moving towards Patient Centric Health Records and Cloud technology

The only way to achieve a truly patient centric system is to provide a fully flexible, open patient record that can easily travel around with the patient whether this be at other Trusts, Hospitals, in the community or the patient's own homes. That record needs to provide an up to the minute, real-time complete single view of the patient for clinicians – crucially at the point of care.

To deliver such an outcome, we see more and more trusts issuing tenders to digitise historic data and implement digital CRM systems with clinical interfaces which can tie together historic and PACS data, as well as manage the current health of the patient and deliver process workflow efficiencies. To do this a stable, secure, cost effective ICT infrastructure and data centres have to be in place that can cope with increased storage and traffic requirements whilst ensuring confidential patient records can be easily accessed and stored in line with DH compliance and regulation. These elements can all be achieved in a flexible and costeffective way using cloud technology and virtualised storage solutions which can easily expand and flex to accommodate growing data issues. In addition, next generation storage systems, designed to handle big data storage efficiently and cost effectively can now deliver a reduction in the space required for storage, improved efficiency and simplified data management.

Tackling security and governance in the Cloud

One of the biggest obstacles or objections for not deploying a Converged Infrastructure or Cloud Computing in the NHS is the fear that data somehow becomes less secure or more susceptible to data loss. And this objection is very understandable, the NHS has been no stranger to column inches generated from patient data loss which has literally been as a result of lost items such as laptops, mobile devices or USB sticks. But with the rise in mobile and flexible working calling for the flexibility and capability Cloud technologies can bring and the growing need for digitised, accessible patient notes accessed via clinical and patient portals - how do Trusts tackle new threats, outbound and inbound, that online hackers and web 2.0 media communications bring?

Array manufacturers have listened to the issues and challenges their healthcare customers face and taken steps to provide simple to use functionality within the arrays that improve security and data governance. This means Trusts and Patients can benefits from software which delivers secure access and robust storage services with watertight administrative segregation for different applications and user groups, (also known as virtual private arrays) to multiple applications, departments and customers without compromising security or allowing access to unauthorised data. These new systems allow organisations to benefit from an ability to grow storage capacity organically as the data grows and operate automated data tiering which allows new data to be retrieved quickly via fast, more expensive hardware whilst older data is moved to slower less expensive storage disks to maximise cost efficiency. In addition new technologies give an efficient and cost-effective way to comply with internal governance meaning that retention periods can be set and individual storage volumes or copies can be locked for specific periods of time so deletions can't be made, effectively rendering the data tamper proof and secure.

So what is the future?

The NHS data explosion is in the process of happening now. Data will continue to increase in volume and with the government showing no signs of slowing its campaign to make patient data more available to both clinicians and patients themselves, so will the need to allow secure, individual, segregated access to different user groups. As care in the community and a desire to put the patient at the centre of their own care also gather momentum (both of which require ICT services that can handle remote and flexible working solutions) data and the need for secure, flexible, accessible, cost-effective solutions also continue to grow. All roads point towards Cloud based storage solutions. Forward thinking healthcare organisations are in the process now of looking at new generation technologies that will future-proof their ICT strategies to deal cost-effectively and securely with this data explosion.

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