IT Contemporary

Connecting ideas
Sharing best practice
Transforming IT delivery

ucisa

April 2021

Sponsored by InterSystems

Digital transformation at a major teaching hospital with insights for higher education

How data interoperability enabled University Hospital Southampton to transform care

To explore the common challenges in digital transformation facing higher education and the healthcare sector, ucisa, in association with InterSystems, organised a webinar in which Adrian Byrne, Chief Information Officer at University Hospital Southampton NHS Foundation Trust (UHS) offered important insights into data interoperability and best practice that have great relevance for higher education.

The UHS experience shows how, with data growing exponentially and technology constantly evolving, organisations in higher education can transform how they use data to become agile, forward-looking institutions that master all the demands placed on them.

Entitled *Accelerating the Development of Open Standards: The Journey to Interoperability with University Hospital Southampton*, the webinar explained how InterSystems' integration engine has helped power a hugely ambitious project that has seamlessly and securely integrated records across systems and departments at one of the country's major university teaching hospitals. This has streamlined and improved patient care, enabled new medical technologies and helped accelerate crucial Covid-19 vaccine workflows.

Just like hospitals, higher education institutions must undergo digital transformation to meet the challenges of the mid-21st Century. Almost all higher education institutions face the challenges of enabling new forms of technology-driven remote and hybrid learning to keep pace with the wider changes in society. This will be based on implementation of advances in education technology and the availability and effective management of all forms of data – from personal details to highly complex research data.

The UHS experience outlined here shows how effective and innovative data-management can reshape services and pave the way for more far-reaching innovation in service-delivery and efficiency. This has never been more necessary in higher education when in England, population growth and changed expectations may require 350,000 more higher education places.

Scalability has become a major topic for higher education, as customer-centricity and the growth of experiential learning come alongside the current requirement for technologies such as adaptive learning, AI, chat bots, predictive analytics and the use of augmented and virtual reality applications. With students wanting fast access to learning resources wherever they are, and digitally native academics demanding data-driven innovation, the impetus is growing for online and face-to-face tuition, remote and on-premises education to achieve equal levels of excellence. However, as the UHS experience demonstrates, delivery requires a razor-sharp focus on agility, simplicity, and cost-effectiveness.

The scale of the challenge and the stimulus for change

UHS provides a very broad range of services to 1.9 million people in its catchment area, plus specialist services such as cardiac care, neurosciences, and children's intensive care to a population of 3.7 million in southern England. Prior to digitisation, more than a million paper medical records of patients were held in a dedicated facility the size of an aircraft hangar. This cost £1.3 million per annum to maintain and came with all the risks associated with paper files.

Progress towards digitisation accelerated with a £10 million cash injection from the NHS's Global Digital Exemplar programme, which requires organisations to lead improvements and share best-practice blueprints. A total of 100 projects at UHS were initiated under this umbrella.

An open platform approach to focus on interoperability

At the commencement of the programme, the UHS team took a very significant decision. They decided they would work with open platforms to focus on interoperability, rather than procuring a big box solution from one vendor, as has been common across the public sector.

The aim was to enable data to move between systems and provide a good user experience without having to buy into a monolithic system structure. Adrian said: "People often talk about different things in interoperability. I mean a system talking to a system, exchanging information."

A big box solution may have taken care of "data-plumbing", but the advantage of an open platform approach was the chance to use best-of-breed tools. In reality, compromises were necessary, and it was not possible for everyone to have the best-of-breed systems they

wanted. The UHS team were also clear they wanted to avoid a chaotic “ball of mud”, agglomerating different systems and solutions without interoperability.

As in higher education, cost also determines choice since some vendors charge in relation to the amount of outbound data. The team had to strike a balance between the right level of technology and necessary economies of scale.

The patient record and data structure

At UHS the core electronic patient record implemented under the scheme is a single database. This contrasts with the common experience in the higher education sector where multiple systems are the norm, acquired over time. The structure of the data at UHS is driven by its purpose, but in an area such as critical care where data is very complex, the hospital now employs proprietary data structures. As the programme progresses the hospital will move to mobile and web applications, rather than a portal approach.

Compliance with data standards is also critical, since the key requirement is for machines to talk to machines, systems, and applications – all using FHIR (Fast Healthcare Interoperability Resources). This is the newest of the main NHS standards for data interoperability. The aim is to concentrate on a build-out that does not require the data itself to move between systems, and for the data to be capable of outliving any system using it.

As in education, data standards are important not only because of the constant transfer of data between departments internally, but also because of the increasing importance of data transfers between different organisations. In the university sector this has obvious parallels with the necessity to share administrative data with official bodies and supply chain partners. But equally, data standards enable the sharing of huge amounts of research and other data with partners and other institutions.

An example of this at UHS is the dispatch of notes to primary care organisations such as GP surgeries following the discharge of patients from secondary care. Primary care organisations need to understand the notes and identifiers, such as the patients’ NHS numbers. It is the high prevalence and management of these identifiers that has enabled the NHS nationally to advance the Covid-19 vaccination programme so swiftly, surfacing the location of patients and their histories. Interoperability, effective integration, and compliance with data standards together enable updating of the GP’s vaccination record while ensuring the information enters the national system.

The digital ward round and a change in culture

An everyday example of how digital transformation has changed everyday practices at the hospital is in ward rounds. The familiar clipboard holding a patient's charts at the end of their bed has gone, replaced with iPads, facilitating access to a far greater amount of information for clinicians.

The accessibility of this system means that with InterSystems technology working in the background, doctors can request pathology tests, ultrasound scans and other diagnostics and request notification on Teams when the tests or scans are complete. This has led to faster delivery and analysis of results and swifter discharge procedures, a key advantage in coping with the Covid pandemic.

The change had met some initial resistance from clinicians, who for decades have used paper charts in ward rounds. This prompted Paul Butler, Director of Information and Library Services at the University of Greenwich, who chaired the webinar, to draw parallels with the university arena where influential senior academics sometimes dissent from IT-led changes. At UHS, however, doctors dropped any initial reluctance because they quickly saw how the new system provided user-friendly, faster access to a wider range of information. They could prepare for ward rounds in advance, even from home, saving time. When the coronavirus pandemic erupted, the new systems enabled ward rounds to proceed remotely, reducing the number of people on wards and the potential for infection.

The programme has not, however, totally eliminated paper documents, which remain in use in certain areas. This will decline, stimulated by increased demand for remote monitoring and the successful uptake of the NHS app. The app is a national initiative allowing patients to log in, book appointments, order repeat prescriptions and see their own records.

The new cloud-based Open Personal Healthcare Record is also based on FHIR and is one of the most successful interoperability projects UHS has undertaken, supporting 15 hospitals. This enables apps to connect to the record. Patients with long-term conditions, such as prostate cancer, for example, can monitor their condition at home reducing purposeless visits to the clinic.

Maintaining momentum

The UHS time-horizon for its selection of technology in this digital transformation programme was between three and five years, the view being that any solution of greater

longevity could be rendered redundant by innovation. To maintain progress and iron out any problems, UHS stays in regular contact with seven strategic vendors, inviting them to sessions where they discuss difficulties and share priorities. All the benefits accrued from the programme are communicated to the trust board, so they understand the significant value delivered by their investment and remain committed to it.

Supporting the digital future of care with deeper interoperability

The webinar heard that just as the student-university relationship will be highly digital, the future for the patient-hospital relationship will be ever more electronic, requiring an integrated core system. This will demand further data interoperability since UHS will facilitate development of more elaborate multi-disciplinary patient care pathways. These enable patients to access treatment in other hospitals as part of a continuous system, with information about a patient's treatment or procedures visible to all relevant clinicians in the pathway.

Another key national initiative that will drive change is the introduction of Integrated Care Systems, which bring together providers and commissioners of healthcare and local government bodies. As digital maturity increases, further innovations within hospital IT will include voice-recognition for patient record systems.

Having outlined how data interoperability underpins all the significant advances UHS has achieved so far in data management and use, Adrian said he felt vindicated in the open platform approach his team had taken. He said Gartner, the global consultancy, now believes the multi-vendor approach UHS adopted is the right one and that the NHS had spent too long on proprietary systems. "The results from staff are very positive and clinicians and medical practitioners feel supported in-patient safety," he said.

Conclusion

For those working within IT in higher education, many of the challenges outlined in this webinar will be familiar. With a large number of different applications and systems and an ever-growing volume of data, health and higher education institutions alike see the importance of digital transformation for greater efficiency and economies of scale. This will enable a future that delivers new kinds of learning experiences in a customer-centred approach driven by technology. A study by Forrester for consultants KPMG International last year[1] uncovered the scale of the challenge, however. It found only 54 per cent of higher education institutions had built an "experience-centric" operating model based on common

digital platforms and only 43 per cent had an enterprise architecture that they felt would support current and future objectives.

What the UHS experience demonstrates is the critical importance of data integration and interoperability. Without effective integration, digital transformation and the effective implementation of e-learning, analytics, AI, and mixed reality technologies is almost impossible. Processes remain clunky and inefficient, providing a sub-standard user experience. Genuine digital inclusiveness and the development of high quality remote or experienced-based learning will be difficult to achieve.

A simplified data architecture is an essential foundation for this, but so are data standards, which will be increasingly critical in the academic sector where the sharing of highly detailed information effectively and securely is essential to everything from advanced research to the automation of many administrative tasks in on-boarding and enrolment.

An institution that lacks these capabilities will always struggle to present itself as a highly agile, digital-first organisation in the age of AI. Without interoperability and integration, the modernisation of services, systems and applications will be extremely difficult.

UHS has shown higher education organisations how integration powers a major programme of digital transformation involving huge amounts of the most highly sensitive data. The hospital has achieved this seamlessly and securely while streamlining efficiency and transforming performance in the middle of a pandemic. A considerable achievement that offers extremely useful insights.

ucisa members can access the webinar recording on the ucisa website via login.

1 https://universitybusiness.co.uk/headlines/over-350000-more-university-places-needed-in-england-by-2035/

2 https://assets.kpmg/content/dam/kpmg/xx/pdf/2020/10/future-of-higher-education.pdf

Sponsored by

ucisa
Registered office: 30 St Giles,
Oxford OX1 3LE

Email: admin@ucisa.ac.uk
www.ucisa.ac.uk

Registered Company No. 09349804