

**Delivering digital transformation  
and innovation in higher education**





## Delivering digital transformation and innovation in higher education

**Digital technology now plays a part in all aspects of university business, from back room services to frontline learning and teaching and the student experience. In some areas, it is already proving transformative for institutions and their staff and students.**

Interviews with Chief Information Officers and other senior staff responsible for digital development in universities have provided an insight into revolutionary change that is already taking place, and the opportunities and challenges that this presents.

Universities are using chatbots and mobile apps to “hyper-personalise” recruitment and the student journey. Content capture and virtual/mixed reality are helping to make the online and campus experiences interchangeable. Data analytics are providing students and academics with more detailed and tailored information and feedback than ever before. The move to cloud services is helping to make university IT faster, more flexible and more secure,

while high performance computing has the potential to bring rapid gains in research capability.

It’s important to highlight that successful digital transformation is not achieved by implementing technology alone but by understanding the outcomes a university wants to achieve from the beginning and building a digital strategy to reach these – technology is however a key enabler in the transformation. This includes exploring requirements of the workforce, the workplace and the workspace.

Automation is also a key consideration for transformation. Automation of end-to-end processes enables services to students and staff to be completed more effectively. It is also a quick way to provide compliance, achieve better governance. From using OCR and bots to complete application forms, to ensuring the bursars office can do accounts payable, automation can help make busy functions more efficient to the benefit of the entire university.

But all these advances require appropriate investment in digital infrastructure and support for staff and students from senior management. Today’s Chief Information Officers and directors of Information Services have found their roles widening in response to these challenges, to include more leadership, engagement and communication.

Vice chancellors are looking to CIOs for their strategic input on how to use digital as a lever for improving students’ experiences and outcomes and bolstering the core activities of the institution.

CIOs increasingly have to strike a balance between infrastructure upkeep and innovation; supporting existing L&T methods and advancing the digital offering; fulfilling the expectations of tech savvy students while reassuring and supporting academics who may not regard IT as a priority; having a consistent approach, patience and a clear vision while brokering the competing demands of academic departments and professional services.

### Limited resources

Limited resources are a fact of life and make it even more crucial that digital strategies align with the wider institutional strategy and university mission. When a clear case can be made for projects that bring demonstrable benefits, resistance to change is less likely and digital can become truly embedded into the fabric of the university.

## How has the role of Chief Information Officer, IS and IT Director changed in recent years?



**“ IT can bring experimentation - moving quickly and moving away from archaic huge projects to short and sharp initiatives where you learn as you go along.”**

Andrew Proctor, Pro Vice-Chancellor  
Digital at Staffordshire University

**As IT has become more critical in just about every aspect of higher education, so the role of CIO, IS and IT Director has become increasingly important.**

The requirement to deliver the basics and provide a quality “back room” service is still there, but vice chancellors are increasingly turning to CIOs to help them improve the student experience, enhance research activities, drive innovation and to make technology a key enabler in that innovation.

Paul Westmore, Director of IT at Plymouth University, said: “We have moved from being the plumbers, dealing with the technology plumbing of the organisation, to being much more involved as influencers in the way teaching is done and in all kinds of areas.”

According to Mike Day, Chief Digital Officer at Swansea University, the level of involvement of CIOs in governance is a sign of whether a university has matured in its approach to digital technology.

At many universities, CIOs are sitting on executive committees and are intrinsically involved in the strategic decisions that universities are making and in ensuring those decisions are compliant and secure.

But as the role becomes broader, it becomes less well defined, which can mean it is less straight forward.

Paul Westmore, at Plymouth, explains: “We used to be very much lords of our domain but we have a much less well defined area of expertise now. We’re seen as having a role in influencing much more widely but there’s not always an open door to that. That’s an interesting challenge. The HE sector is a little bit less progressive in that respect. We are only one of the voices that are driving digital transformation.”

According to David Ford, CIO at the University of Hertfordshire, senior professional staff in his position have to have a real understanding of the possible impact of projects and be able to broker and prioritise, working with senior managers to help them understand the bigger picture.

Vipin Ahlawat, Director of IT Services at Loughborough University, makes a similar point that the role has become very much about building partnerships and using them to work out how IT can really deliver value to a university.

Digital is not just about the technology: it can also bring cultural change. Andrew Proctor, Pro Vice-Chancellor Digital at Staffordshire University, said: “IT can bring experimentation - moving quickly and moving away from archaic huge projects to short and sharp initiatives where you learn as you go along.”

## What areas of university business have been most affected by new technologies?

**The CIOs interviewed agreed that all aspects of university business have been affected by new technologies, from administrative and procedural processes, teaching and learning and the student experience to recruitment and research.**

Interviewees outlined the increasing importance of content capture, and virtual and mixed reality in allowing students to access learning at a time, place, and format of their choosing.

Some institutions are in the process of considering the “next wave” of thinking on interactive teaching, including the gamification of education experiences and teaching complex simulation techniques using a mixed reality.

At Anglia Ruskin University, virtual reality and augmented reality, developed internally as well as off-the-shelf, are transforming L&T (learning and teaching) in social care and the University’s medical school.

Digitalisation is also impacting on recruitment, enrolment and registration. Chatbot technology is being harnessed here, in particular, to provide a more instant, personalised response. Institutions are beginning to look at how this technology can underpin the whole student journey. Data and learning analytics is an integral part of this, boosting engagement and providing information so that students can make informed choices.

Universities are putting much effort and investment into Customer Relationship Management (CRM), student support platforms and developing mobile Apps. Building on the expectations of the digital student and in the push for efficiency, institutions are looking at how they can move to more self-service and online interactions.

This element of digital transformation requires a change in thinking, moving towards the “hyper-personalisation” of the student experience, according to Andrew Proctor at Staffordshire University.

“This is less about just sheep dipping people through this very effective and efficient process and more about providing products and services that flex around students’ commitments outside of their academic pursuits,” he said.

John Hemingway, CIO at Durham, added: “If you look at what a student’s life is like outside the institution, it is run by a series of apps. If the student experience included a series of Apps that complements the off-campus set of apps, it means they can run their life in an integral way whether they are on campus or off it.”

In Research, the potential offered by high performance computing was highlighted by a number of interviewees.

Seamus Doyle, Director of Information Services at Queen’s University Belfast, commented: “High performance computing and digital data management are going to be very strong enablers of the research activity and drive productivity.”

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## What impact has digitalisation and new technologies had in these areas?

**Interviewees agreed that the impact on Teaching and Learning, in particular, has been significant, improving classroom practice, access to content, engagement and feedback.**

At Anglia Ruskin University, medical students do many of their assessments online which enables the examination system to be joined up with the student data base - allowing students to access data on how they perform on a particular question compared to the average. Feedback has become quicker and more specific through the use of virtual and augmented reality, which means lecturers can show students what they did and how they can improve on it.

Feedback from students is also driving curriculum design. At Loughborough, online feedback on individual modules puts direct information from students in the hands of staff who can react to it, almost in real time, and assess what is working and what is not.

Content capture and mixed learning also provides the flexibility to cater for non-traditional students and develop courses such as degree apprenticeships.

Technology is also allowing students to access information and carry out activities, both academic and extracurricular, on their mobile phones.

A number of universities are using chatbot technology. For example, Anglia Ruskin's recruitment chatbot can respond specifically to the enquirer and give them a tailored answer in a way that a series of FAQs cannot. It is also more efficient than one-to-one communication: "One person can supervise 4 or 5 channels of chat, so it is actually more efficient than a call centre. It helps us as well as helping the enquirer," said the University's Chief Operating Officer James Rolfe.

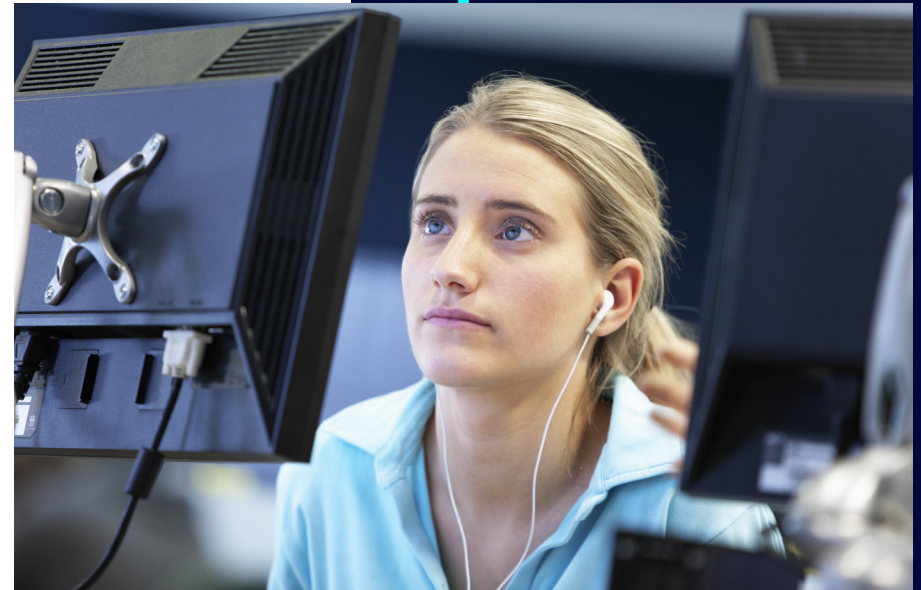
Andrew Proctor, at Staffordshire, described how the use of machine learning techniques is helping to reduce the strain on freshers by using knowledge gleaned from the application process, students' modular choices and a mobile app survey to highlight activities and clubs specific students might be interested in rather than bombarding them with information.

In some cases, the impact of technology on certain aspects of university business has been profound. At Plymouth an entirely paper-based recruitment and admissions system, involving hundreds of wire baskets and filing cabinets, was completely automated three years ago. It has reduced the size of the team by half and the average turnaround time of decision making has gone from about 60 days to just two.



### MOVE TO AUTOMATED RECRUITMENT AND ADMISSIONS SYSTEM

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## Why do universities need a digital strategy?



**All CIOs reported a digital strategy in some form, whether a discrete plan or as part of an institutional strategy. Some were in the process of rewriting or updating strategies.**

There was general consensus that the digital strategy must have “substance not just style”. It must be “mission-aligned” and support the key elements in the institutional strategy, as well as having regard to the overall infrastructure and IT plan.

James Rolfe at Anglia Ruskin commented: “I think there is a slight risk that the Digital Strategy can be terribly eye catching, but light on substance. If you are trying to plan your whole IT offer, and understand the return on investment, you need to see the infrastructure and digital piece together.”

A number of strategies are moving towards a situation where physical and digital learning and teaching is integrated.

At Plymouth, the digital strategy is built around the objective of an “edgeless university”.

Paul Westmore explained: “The way that is starting to materialise is that students and staff can carry out any function they might want to carry out without ever being physically present in the university. We’re not there yet but that’s what we are working towards.”

The University of Hertfordshire has a similar ambition of reaching a stage where

users will not distinguish between whether they are in a classroom or using a virtual learning environment. In L&T, strategies not only push the boundaries but support the good practice that already happens.

At Loughborough, which scores highly in league tables on teaching, digital reinforces the face-to-face offering.

“Students clearly like what we do,” said Vipin Ahlawat. “We very much feel that digital can make that better rather than throw the baby out with the bathwater.”

Loughborough’s strategy also focuses on the digital fluency of staff and students. For the latter, a mobile App, called Personal Best, targets their own personal development ensuring they can make use of these technologies and boost employability and life skills. Similarly, Staffordshire embeds digital skills across courses to ensure they are built for Industry 4.0 and to future proof students for the modern workplace as much as possible.

Seamus Doyle at Queen’s University Belfast emphasised that ultimately, the digital plan had to support and inform the university’s main functions: “The important features tend to come back to the core activity of the university - teaching and learning, student experience and research activity - and if you are supporting all of those.”

## What digital solutions have improved key areas of university digital strategy?

Many universities have moved to or are in the process of moving to cloud-based solutions, providing greater security and flexibility of service. At Hertfordshire, for instance, a new VLE and the HR and finance systems are now cloud based and the internal infrastructure has been set up to provide a hybrid solution so cloud services can be used as and when necessary.

For many interviewees, there has been a shift in emphasis in recent years away from big, long lead time projects to smaller scale, “quick win” solutions.

John Hemingway, at Durham, explained: “We are trying to move from a situation where you have long duration, very monolithic, very complex projects to initiatives where you can fail much more quickly and actually make decisions about things that are going to make a difference to the institution.”



Queen's University Belfast is implementing a new cloud based virtual learning environment, with Canvas. Meanwhile, digital technology is feeding into the development of blended learning at Swansea and allowing the university to explore the impact of more online delivery in areas such as library services and student care and support. The university is using digital to develop its own solutions, rather than buy off-the-shelf. Tools that are simple to use and high impact provide part of the solution to potential issues with digital literacy, says Mike Day.

Digital skills are also a focus at Staffordshire where they have been embedded across courses and via qualifications from Microsoft, which give students the opportunity to master Microsoft Office suite, cyber security, entrepreneurship, and awareness of Cloud technology.

Loughborough has invested in learning analytics to put more information in the hands

of students so they can better judge how they are performing, and for academics so they can support students better and improve outcomes.

At Plymouth, enterprise-wide CRM, through Salesforce, has been a transformative development.

Paul Westmore said: “It was a difficult sell initially. Some people thought of CRM as being a strange alien invention that did not have any place in higher education and there were concerns about the work implications, but a lot of people have bought in now and it's proved very successful.”

Simple solutions can have a big impact. The creation of a single sign-in for staff at Plymouth means they can log in once and access all the applications and data that they need for their role. This has been fundamental in cutting down on inefficiencies and overheads.





Chatbox provides 24/7 help and assistance



Digital registers using a mobile app



Mobile app showing students where there next lecture is

## What type of digital projects are universities undertaking?

**CIOs mentioned a range of digital advances from mobile apps and chatbots to virtual learning and e-sports.**

At Staffordshire, a digital coach and support system – Beacon – has been launched in the last couple of years. It uses a chatbot to provide a variety of help and assistance 24/7 but is also two-way, so conversations can be started with students. The next step is to engage with third parties to integrate some aspects of mental health and wellbeing, such as signposting to self-assessments and counselling services. The technology has the potential to feed into L&T with students able to give feedback on lectures that goes back to the lecturer in real time so they know if something has worked or not worked, giving them time to change it before the NSS survey.

Loughborough has rolled out lecture capture across all of its teaching events in the last two years and has also introduced digital registers, using a mobile App and Bluetooth, which make it quick and easy for students and staff to register attendance.

At Queen's University Belfast and Hertfordshire, mobile Apps for staff and students have been developed which can tell them where their next lecture is and how to get there with a link to a campus map, as well as where the nearest free PC is when the library is busy.

Advances in L&T at Plymouth in the last few years means students at the university's health and human sciences school, who are working in hospitals or GP surgeries, can participate in seminars, submit work,

access marks and sit exams online through remote learning.

Digital technology is also central to a new £40 million Teaching and Learning Centre at Durham University that opened in September with 500 new learning spaces, including rooms that have multiple screens to display content simultaneously.

Swansea is looking at a new Canvas virtual learning environment, collaboration tools such as Zoom and enhancing its Microsoft Dynamics CRM solutions. Mike Day said the team is doing its own development around research information systems and the online applications system, reviewing online and app-based enrolment.



## What are the main challenges to maximising the benefits of digitalisation, and what are the most exciting opportunities they present for the future?

**“What we want is students to be able to see on a single dashboard their entire relationship with the university”**

James Rolfe at Anglia Ruskin

**The main challenges come from both internal and external pressures ranging from university finances and the need to deliver value for money to changing mindsets and improving digital understanding and skills at all levels including governance.**

Interviewees mentioned the importance of picking priorities carefully, taking into account the university's core activities and strategic aims. A number also suggested that IT departments need to get better at communicating to colleagues and selling their vision to secure the right level of investment and commitment.

Getting the pace right is a challenge: “If you go too slowly, you don't keep up with advancements. If you go too fast, you overload people,” said James Rolfe, at Anglia Ruskin.

David Ford, at Hertfordshire, identifies the issue of having the time and resource to follow through post-implementation.

“Your typical Microsoft Office user only uses about 10 per cent of the functionality and never actually explores all the other things. There's a

risk that you put in a big corporate system and do the same things with it,” he said.

When the demand for new technology far outstrips supply, it may mean IT teams have to be prepared to “act as a conductor rather than a gatekeeper” and enable other departments to innovate, according to Vipin Ahlawat, at Loughborough. In departments with little experience of IT this may bring the challenge of providing greater support and handholding, said David Ford at Hertfordshire.

Cybersecurity is a constant concern of CIOs and a growing issue. For Seamus Doyle, at Queen's University Belfast, the biggest challenge is balancing the ease of use with the security and privacy of the user. Vipin Ahlawat said universities in particular struggle with cybersecurity because they are, by their nature, open organisations.

Digital developments present challenges that could make the life of CIOs harder but they also present opportunities.

The potential of AI, automation and machine learning could be transformative, particularly

in rule-based decision making, according to some interviewees.

For James Rolfe at Anglia Ruskin, better data and insights around the student journey will bring a very strong customer focus.

“What we want is students to be able to see on a single dashboard their entire relationship with the university: how much money they owe, whether they have deadlines coming up, day-to-day living issues,” he said.

John Hemingway, at Durham, said digital had the potential to change business models and generate income, by partnering with a vendor or setting up a commercial operation to develop digital solutions.

Andrew Proctor, at Staffordshire, also points to new business models growing out of digital transformation.

“We could be thinking, what is the best way of equipping people for the future, rather than what is the best way of providing a university. That is hugely challenging and takes people out of their comfort zone, but it is a massive opportunity for digital,” he said.

## What are the main barriers to successful digital delivery within the institution?



**Barriers to successful digital delivery identified by CIO's include changing culture and overcoming resistance to change; internal staff capability; accountability; investment and benchmarking; over-ambition in the short term; competing initiatives; and using digital as an add-on rather than embedding it across services and administration, departments and academic programmes.**

Time and again interviewees mentioned the importance of up-to-date skills.

For Paul Westmore, at Plymouth, digital skills are a real issue, particularly among academics

who might not see mastery of IT as part of their job: "Dropping technology onto a set of people that do not think in technology terms is quite a big challenge. And that's actually my issue not their issue. I need to help them understand how it is valuable to them and support them in knowing how to use it."

Even among IT staff, there may be issues with "capability maturity". According to Mike Day, at Swansea, universities tend to put people in tech roles who have only ever worked in universities, and quite often in just one university.

"There can be an issue in those technologists knowing what 'good' looks like," he said.

A related issue is getting sufficient input from across the university before and during a digital project: "Getting that buy-in, getting that contribution is a challenge," said David Ford, at Hertfordshire.

Successful digital delivery requires clear accountability, according to Mike Day. For him, this means embedding what is expected of all leaders in terms of digital in much the same way as finance or HR.

"Embedding digital as part of your governance and Key Performance Indicators (KPIs) and demonstrate conviction that you are genuinely leveraging digital – that's a key to success and a barrier if it doesn't exist," he said.

Mike Day warned that the absence of digital investment benchmarks for HE is a barrier. "While funding councils ask universities about their investment in buildings and people, they don't ask how much institutions are investing in digital and therefore it is not a focus when you are having funding discussions."

At a time of budget pressures, IT, like other departments, has to make efficiencies and savings. Infrastructure needs to be modernised and refreshed, requiring specific and targeted investment, over and above more ambitious digital plans.

## How can universities measure the success of digital activity and investment?

**Methods of assessment depend on the nature of the project. At times it can be measured by the bottom line. With other initiatives, related to the student experience, the causal link between investment and outcome can be less clear. Here universities employ a number of indicators of success, such as National Student Survey (NSS) scores, responses to staff and student surveys, retention and attainment and league table positions.**

Some activity has specific measurable targets. For instance, the aim of a recent multi-million-pound investment in wireless infrastructure at Queen's University Belfast was to increase download speeds by a factor of three.

For David Ford, at Hertfordshire, one good measure is the level of engagement with the new solution: are people using it and are they using it willingly and not just because they have been told to.



When the impact of digital investments is harder to estimate, it is essential to marry the business case with institutional priorities, according to CIOs.

“The key thing is understanding the alignment between the digital strategy and the institutional strategy and being really clear about whether the things that you are doing within the digital strategy are contributing to your more strategic outcomes,” said John Hemingway, at Durham.

Mike Day has devised a range of diagnostics that cover eight major priorities which means that with any digital project, progress can be demonstrated and the impact of investing, and of not investing, can be shown.

For James Rolfe, at Anglia Ruskin, success is ultimately measured in terms of student and staff satisfaction. IT teams at all

universities focus heavily on NSS question 18, which is specifically IT focused. Loughborough has topped the table in England on this measure for the last five years and works hard to maintain its position by engaging with the student body before, during and after the roll out of new services.

The comments section of the NSS is reviewed by some CIOs to make sure that within the digital portfolio there are projects that address concerns and build on initiatives that have garnered favourable comments.

Paul Westmore, at Plymouth, said: “Like all universities we are quite strongly driven by NSS results. We do quite a lot of analysis to see where students have issues and whether the things we have done have made those better or worse. NSS comments drive action plans and reflect into projects.”

## How can universities ensure that their digital infrastructure is fit for purpose and able to meet the growing and changing demands of students and staff?

**Beyond the obvious need to invest in infrastructure, both to refresh and renew and to innovate, interviewees mentioned building agility and flexibility into digital services, working harder at engagement, communication and collaboration and maintaining consistency and patience.**

The ability to advise, prioritise and lead were also regarded as essential components of the “digital journey”, as was strong support higher up in the organisation.

For Mike Day at Swansea, IT teams need to get away from trying to do everything, to focusing on what is important to the institution; ensuring digital is truly embedded, aligned and converged with the mission so that it demonstrably makes a difference.

Getting the right level of resource was mentioned by nearly all CIOs. As John Hemingway at Durham, put it, a sure-fire way to ensure that your digital infrastructure is not fit for purpose is to have, “a Rolls Royce ambition with a Mini Cooper budget”.

It is also about using that investment wisely and looking to the future: “We need to become much more agile and flexible, which means changing our technology and changing our procedures. That is going to be vital for IT departments over the coming years,” said Vipin Ahlawat at Loughborough.

For instance, Staffordshire’s move to cloud services means IT can move more quickly - putting less focus and effort on maintaining servers and data centres, and freeing the resource to focus on creativity, transformation and innovation.

According to David Ford at Hertfordshire, agility can sometimes be hampered by the gap between legacy systems that have not caught up, and new types of systems that do not necessarily do everything that the old systems can do.

For Paul Westmore at Plymouth, there has to be a top-level appreciation that digitalisation is not just “a load of shiny baubles”, it is a conceptual approach to the way university services are delivered.

In a market-based sector, effective digital investment is a vital part of any HEIs competitive edge.

James Rolfe at Anglia Ruskin sums it all up: “The essential ingredients are adequate resourcing, proper prioritisation and leadership. Sometimes digital can be seen as fourth or fifth tier – it’s just something that happens and people don’t need to focus on it – when actually it is something that needs to be led at a very senior level and that will increasingly be the case.”





## Thank-you's and conclusions



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We would like to thank Media FHE for their research and the university CIOs, IT directors, senior managers and professional staff who contributed to this whitepaper.

The accelerated rate of change in higher education demands that your IT infrastructure puts agility at the heart of everything it does. As the No.1 provider of education software and IT services in the UK, Capita is in a prime position to help universities react faster to challenges in the sector

Universities depend on a reliable IT infrastructure in order to access key systems, learning resources and to use technology in the classroom to support teaching and learning without interruption.

In order to achieve digital transformation, along with having a reliable IT infrastructure, universities require a clear strategy including:

# 01

The creation of a **Digital WorkFORCE**; - the key to this, is challenging the culture and behavioural values of the university.

# 02

The creation of a **Digital WorkPLACE** – introducing automation to reduce time spent completing manual processes or repetitive tasks. Universities can also implement an identity- first approach to delivering end-user services and remove unnecessary barriers to accessing resources.

# 03

The creation of a **Digital WorkSPACE** – exploring how the physical space available is used and how it can be optimised once the Digital WorkFORCE and Digital WorkPLACE have been achieved.

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