

# School of Informatics School IT strategy 2019-2022

January 3, 2019

This document lists a considerable number of challenges and related actions. It is unlikely that all can be addressed in 2019. The School will prioritise the actions in early 2019 for inclusion in the annual School Computing Plan.

## 1 Leadership in Learning

### 1. **Challenge** Improving quality of teaching and learning

**Action** We wish to make substantially more use of University infrastructure (particular learning technologies such as Learn) and less use of bespoke solutions within the School. We consider this shift to be a challenge in itself as we need to identify how to achieve this without negatively impacting on School business. This year we will focus on :-

- considering how to support course related material effectively
- considering course work submission mechanisms, taking into account the proliferation of available tools and authorisation issues (partly related due to the increased employment of student assessors)
- scoping out the resources required for more blended learning (face-face, online and distance)

A working group has been formed to produce a strategy for increasing our use of Learn and other related tools.

We will consider more use of analytics to monitor performance of students through the academic year.

Students now expect to use Piazza for courses - we shall investigate what we can do to facilitate this further.

Building on the recent expansion of teaching space in the Appleton Tower, we are planning to further invest in teaching infrastructure, including IT provision, in response to evolving technologies and teaching methods.

We are reviewing the DICE desktop platform to determine whether it is still the most effective vehicle for supporting teaching course work.

We are considering growing our Learning Technology resource, having appointed a Learning Technologist in 2018.

### 2. **Challenge** Growth in taught student numbers. We have already grown substantially and, whilst we don't expect any further significant intake in the medium term, our student population will continue to grow as the increased intake works its way through the years.

**Action** Consider how we can improve the efficiency of our teaching estate.

### 3. **Challenge** Increasing delivery of teaching in partnership with other Schools across the University

**Action** Consider how to effectively support the delivery of such teaching

### 4. **Challenge** Volatility amongst student course choices is a big challenge - this leads to significant problems with resourcing at very short notice.

**Action** Build on progress already made in 2018. However, the School is not entirely in control as some of these courses are delivered in partnership with other schools.

5. **Challenge** Requirement for increased diversity in modes of delivery - to cover face-to-face, on-line Masters, distance learning at scale, DataScience Technology Innovation programme and graduate apprenticeships.

**Action** Consider how to meet these requirements

6. **Challenge** We have a growing requirement for computing resource, particularly GPU based, for both teaching and research. Hosting this computing resource is an increasing challenge (see Section 5).

**Action** The School has formed a working group to produce a strategy for resourcing the compute and data intensive needs of the School. This strategy should be delivered in early 2019. Meanwhile, the School has recently procured a compute cluster with 200 GPUs for teaching machine learning and has secured funding for a further compute cluster with 80 GPUs for research postgraduate use. We expect that the University requirement for GPU provision will grow substantially as machine learning is adopted in more and more academic disciplines.

7. **Challenge** We have a growing requirement for specialised practical lab provision (eg IOT, security and networks in addition to existing robotics). This requirement is shared with Research.

**Action** Consider what computing infrastructure is required.

8. **Challenge** We are hoping to be awarded a similar number of CDTs in the next round

**Action** Although we have attempted to identify the commodity computing requirements for these new CDTs in advance of the bids, and include in the costings, we have not yet been able to do so for specialised computing support.

## 2 Leadership in Research

1. **Challenge** We have a growing requirement for computing resource, particularly GPU based, for both teaching and research. Hosting this computing resource is an increasing challenge (see Section 5).

**Action** The School has formed a working group to produce a strategy for resourcing the compute and data intensive needs of the School. This strategy should be delivered in early 2019. Meanwhile, the School has recently procured a compute cluster with 200 GPUs for teaching machine learning and has secured funding for a further compute cluster with 80 GPUs for research postgraduate use. We expect that the University requirement for GPU provision will grow substantially as machine learning is adopted in more and more academic disciplines.

2. **Challenge** The execution and expansion of research - the growth in the size of the School has made it difficult to keep track of developments within the School. As a result requirements are often discovered at the last minute impacting on the ability to meet the requirements in a timeous fashion.

**Action** Computing staff will be working with the recently appointed Head of Research Services to consider how to improve information flow particularly with respect to the IT requirements of recently awarded research grants.

3. **Challenge** Security accreditation is increasingly being required by partners, and perhaps even more so with industrial partners. We have achieved CyberEssentials Basic certification for our DICE managed systems. We expect to find it more difficult to achieve accreditation for those systems managed by individual research groups (known as self-managed systems).

## **Action**

4. **Challenge** It is not possible for the School to be confident that the security of self-managed systems is adequate and that best practice is being followed. Systems with inbound firewall holes are of particular concern.

**Action** Mandatory training materials are being developed for those individuals managing such systems. We will also look at why individuals chose to manage their own systems with a view to reducing the number of such systems.

5. **Challenge** The uptake of DataStore in Informatics has been poor largely due to the lack of an authenticated remote file system such as kerberised CIFS or kerberised NFS.

## **Action**

6. **Challenge** An increase in robotics research is expected with the move to Bayes.

**Action** Identify requirements.

7. **Challenge** A number of industrial labs will be located in Bayes.

**Action** Identify the IT requirements for these labs and consider how to satisfy and resource those requirements.

8. **Challenge** CityDeal and Hubs - the requirements here are still rather unclear

**Action** Consider implications of these and how to resource any computing requirements

## **3 Digital Transformation and data**

1. **Challenge** While the School has a good handle on what administrative data it holds and processes, there is no central record of what data is held by research groups and for what purpose. This is of particular concern with respect to GDPR compliance.

**Action** As there has been no further sign of a College data registry, we have decided to implement our own registry. We have performed a one-off survey of what data is held by research groups and will record that in our new registry. The School's computing staff and the recently appointed Research Data Manager are discussing how to keep this registry up-to-date. Holding Data Management Plans centrally at School level is likely to be part of the approach. We would like the University to consider procuring or developing a central system and process for managing data (particularly research data). Such a system would support the management of data throughout the life of a research project and take into account the reality that such data can be located and processed in a wide variety of systems, not just those provided centrally by IS.

2. **Challenge** Supporting and integrating with the Service Excellence Programme

**Action** Our view is that too little is known at this stage about how much the Service Excellence Programme will affect the School's computing infrastructure

3. **Challenge** Data Science

**Action** We have appointed a Senior Data Scientist who will play a key role in growing and delivering data science expertise within the School and the wider University.

## **4 Influencing globally and contributing locally**

1. **Challenge** Partnerships with other Bayes occupants. In particular, we expect tighter teaching and research links with Design Informatics and EPCC.

**Action** Whilst formal administrative mechanisms are now in place with both Design Informatics and EPCC, we have yet to identify IT requirements resulting from these partnerships.

2. **Challenge** A couple of institute web sites are still hosted on a Plone CMS system and require migration to EdWeb. Some research groups maintain their own web technology - with the risk that best practice is not being followed.

**Action** We are reviewing the School's web strategy in early 2019 to provide a stronger steer for the School's web presence, linking with the new University Web Strategy where appropriate.

3. **Challenge** The School should make it easier for people to adopt our research software whilst maintaining IPR.

**Action**

4. **Challenge** A number of commercial partners in the School have been connecting to Janet in a manner which is no longer considered compliant with Janet regulations.

**Action** We will extend, to Appleton Tower, a support framework recently developed for Bayes. This will involve some commercial partners migrating to BCE connections.

5. **Challenge** Possible interaction with Health Data Research UK.

**Action** Unknown at this stage.

6. **Challenge** World Class Data Infrastructure

**Action** It is unclear how the School will be involved in this

7. **Challenge** Facilitating collaboration/international co-working

**Action** We are improving our video conferencing facilities by making VC more pervasive throughout our meeting rooms. We are in the process of shrinking a number of the printer areas in the Forum in order to create small meeting room pods. These will be specifically for occupants of multi-occupant offices wishing to make video conference calls.

## 5 People, Finance and Estate

1. **Challenge** The increasing use of Office365 tools across the University is causing an upskilling requirement for, primarily, our administrative staff and the front line computing support staff.

**Action** We are considering appointing an additional computing support officer who already has good working knowledge of the entire Office365 tool set, but particularly Sharepoint.

2. **Challenge** There are a number of concerns related to the computing staff resource : the age profile of the computing staff is of concern, particularly with respect to data network expertise; there is a growing concern that the current computing staff structure is no longer appropriate; the rapid growth of the School has not been met with a commensurate increase in computing staff.

**Action** The School has started succession planning, and is considering structure as part of this planning. The School is also considering appointing additional computing staff targeted at areas of growth (eg GPU cluster support)

3. **Challenge** It is difficult to measure staff engagement with University and College security policy, particularly as so much data processing is done on systems which are self-managed.

**Action**

4. **Challenge** We are close to being unable to absorb any more growth in compute resource. We have fully occupied our allocation of space in the Appleton Tower and College server rooms and, whilst we have some physical space left in the Forum server rooms, we are reaching the limits of our Forum UPS provision.

**Action** We shall continue to encourage users to make use of centrally provided facilities wherever possible, but in almost all cases our compute resource provides functionality - eg dedicated GPUs, low level access, specialised hardware - that is unavailable centrally, unavailable in the capacity that we need or only available for research use.

5. **Challenge** Much of the IT infrastructure (network core switches, UPS, AV) in the Forum is now reaching, or is arguably past, end of life.

**Action** The Forum and Appleton Tower network core switches were replaced in summer 2018. They were 10 years old and the risk of delaying their replacement was considered to be too great. The School continues to incrementally replace the Forum AV equipment.

It is now clear that Estates expect Schools to fund UPS system replacements. We are discussing the replacement of the Forum UPS systems with Estates and hope to fund the replacement in 2019 - this will allow us to make use of the remaining space in the Forum server rooms.

6. **Challenge** The University network replacement project will deliver over 2019 to 2021. It is not yet clear whether the School will continue to completely manage its own network, work in partnership with IS or hand over management entirely to IS.

**Action** Continue to engage with the procurement and implementation projects.

7. **Challenge** The continued growth in computing resource impacts on our ability to conform to the University's Climate Strategy.

**Action**

## 6 Others

1. **Challenge** The future of the network file-system used by our School systems (OpenAFS) is in doubt.

**Action** We are currently looking at alternatives.