University of the Highlands and Islands

ICT Strategy 2015-20

Providing, Supporting, Connecting

Introduction

ICT is now fundamental to the delivery of any organisation's operational and strategic goals. The University of the Highlands and Islands is a modern, widely dispersed organisation, operating in a highly competitive and fast moving sector. The university's demographic ranges from those that are increasingly "tech savvy" with high expectations of the services they are consuming to those with very low levels of digital literacy. To fulfil its potential, the partnership needs a modern, coherent and effective ICT service.

In the current economic and funding climate any new investment in ICT needs to be based on sound academic and business reasons. Operational efficiencies need to be maximised and services improved. This ICT strategy will allow the university to make informed technology choices that can be implemented in a coherent and efficient manner across the partnership, ensuring an equivalence of experience and quality of service.

This strategy aims to minimise risk to the organisation focusing on reliability and convenience, based on a range of commodity applications and services. We will maximise the use of cloud services where appropriate, recognising the limitations of access to sufficient and reliable data communications in particular areas of our region. Due to the particular nature of our geography and teaching provision there will be instances where we will need to utilise specialist technology, for instance video conferencing. A strong foundation of connectivity between our sites and on campus is key to maximising the benefit of information technology. We will continue to invest in our wide area network (WAN) to provide adequate capacity and resilience where possible, and sufficient connectivity on campus, both wired and for Wi-Fi to allow students and staff work flexibly on a variety of devices, including their own.

Vision

PROVIDING, SUPPORTING, CONNECTING

Providing a modern and enabling technology experience for students and staff.

Supporting learning, teaching and research with quality tools and facilities.

Connecting the region with modern communication tools across a resilient data network.

The Environment

ICT is an enabling strategy for delivering the university's strategic plan and it is important that it is responsive to the current and future challenges of the university's internal and external environment:

- Student experience is a key measure of success and an influencing factor in recruitment and retention. Given the university's geography and its reliance on technology to deliver its mission, the ICT experience from the range, quality, newness, usability, consistency and convenience of the services offered, is an important factor in determining satisfaction;

- There will be continued development of UHI's curriculum delivery model for FE and HE including greater use of shared teaching resources and the continuation of networked delivery through existing, including VC, and new collaboration tools;

- Strategic growth, particularly in HE FTE in the south and west of the Highlands and Islands and internationally through existing and new distribution channels;

- The university is pursuing RDAP and a corresponding growth in research activity, requiring research data management and specialist services;

- The university is investigating delivery in further health related areas requiring specialist support for both library and IT;

- Funding pressures mean extending the life of equipment and a drive to make all services as efficient as possible;

- Following the McClelland review the Scottish Government has embarked on a shared services agenda for the public sector;

- ITaaS (IT as a Service) and Cloud computing are developing models of service delivery that, where appropriate, offer greater flexibility, agility and transparency. Taking advantage of this needs new skills and ways of working;

- Highlands and Islands Enterprise are funding a program of fibre broadband roll out across the Highland and Islands that should bring better opportunities for connectivity and resilience;

- Historic ICT investment patterns have not emphasised whole life energy costs and total environmental footprint of systems;

- Statutory carbon reduction targets will be pushed down to smaller enterprises and the university will only be able to address these in a coherent manner if the entire ICT estate is considered as a whole.

Vision	Providing a modern and enabling technology experience for students and staff. Supporting learning, teaching and research with quality tools and facilities. Connecting the region with modern communication tools across a resilient data network.						

Drivers	**University**	**External**	**Technology**
	• Student experience • New distribution channels • Research growth • Estates strategy	• Public sector shared service agenda • Regionalisation • Environmental targets • Funding pressures	• Next generation broadband • Cloud • Mobile devices • Software as a Service, IT as a Service

Themes	T1	Experience and enablement	T2	People and skills	T3	Capacity and resilience	T4	Environmental and operating efficiency
		Enabling people to access the services they need, where and when they require them.		Allowing people to "work smarter" through optimal use of digital technology.		Developing the data network capacity to meet increasing demands.		Operating as efficiently as possible by reducing duplication and divergence and maximising common solutions and standards.

Actions	A1.1	Provide a modern and relevant ICT experience.	A2.1	Enhance self-service and out of hours support.	A3.1	Secure the next generation data network.	A4.1	Consolidate onsite data centres and exploit developments in efficient server technology and cloud services.
	A1.2	Technology and applications able to support existing and emerging research and teaching and learning methods and delivery channels.	A2.2	Build capacity to deliver digital first.	A3.2	Provide a safe and secure ICT environment, compliant and cognisant with latest ICT security best practices and threats.	A4.2	More efficient environmental control and utilisation monitoring of ICT assets.
	A1.3	Make it easy to communicate and collaborate within and outside the university.	A2.3	Embed customer service as a cornerstone of the ICT service.	A3.3	Increase resilience to minimise disruption.	A4.3	Move from capital infrastructure to revenue based services.
	A1.4	Make connecting to our services easy and reliable.	A2.4	Gaelic interface for accessing ICT services where practical and possible.	A3.4	Open data for research and institutional requirements.	A4.4	Collaborate in regional and national shared service initiatives.

Strategic Themes and Actions

The ICT service will have a set of core strategic themes which will be the foundation of any service development and offering:

T1 EXPERIENCE AND ENABLEMENT

ENABLING PEOPLE TO ACCESS THE SERVICES THEY NEED, WHERE AND WHEN THEY REQUIRE THEM.

A1.1 Provide a modern and relevant ICT experience

We will continually look to innovate and exploit technology in order to improve the student experience and increase the effectiveness of learning and teaching. To provide a service that is easy to use and reflects, or exceeds, the customer expectation of how ICT should be delivered.

A modern experience

We will have a commitment to regularly update and refresh the environment and applications offered to ensure they keep in step with the release schedule and supported versions of the supplier and reflect what students and staff expect to have from their own home and mobile computing environment.

There has been a marked increase in the pace of change in hardware, operating systems and applications. With more applications being delivered as Software as a Service (including Office 365) and Microsoft's deployment of Windows 10 and Office 2016, coupled with vendors responding to new security threats in a timely manner, we will gradually lose the ability to "hold back change" and run on older versions of software. Decisions to update will be made within the context of providing as stable an environment as possible for any one academic session but balanced against the risks of maintaining security and supported versions.

Proposed refresh schedule for the desktop:

- Deploy Windows 10 by the start of academic year 2016/17
- Deploy Office 2016 by the start of academic year 2017/18

Student portal

Deliver a portal that provides easy access to all the information and resources students need to successfully study at the university, from enrolment to alumni. It will include personalised content based on their location, and information they can subscribe too, such as local news, clubs and courses.

Application delivery

Provide easy access to key applications, data and tools to everyone, everywhere from common end user devices including the desktop, laptops and mobile. Delivered through a standard technological means, with remote management, exploiting cloud applications where possible and upgrading

software licensing to a common standard. This will lead to a reduction in the need for the remote desktop (Citrix) solution MyUHI.

Enterprise applications

Enterprise applications will be reviewed on an on-going basis to ensure they are relevant and fit for purpose. Work is already under way to consolidate some of our disparate enterprise systems (Finance and HR). Research management has recently been procured as an "off the shelf" subscription service incurring only marginal setup costs. As Software as a Service becomes more prevalent we will see a move away from high upfront costs to smoother ongoing maintenance and subscription costs.

Student records system

The student records system (SRS) was implemented in 2004 and has been continually expanded and refreshed since then. It will be prudent to review the SRS to see if it is still fit for purpose to meet the needs of the university. It is estimated that a full reimplementation of the functionality currently employed within our current SRS would cost in the region of £1M, in addition to ongoing costs of ownership of the existing or a replacement system.

Business systems convergence

There are currently projects underway to converge the Partnership's finance and CRM systems. HR will be investigated at a later date.

A1.2 Technology and applications able to support existing and emerging research and teaching and learning methods and delivery channels

It is important that the teaching, learning and research activities of the university are not dictated or limited by the technological offering but that they are the driving force for change and adoption.

The historic "one solution for all" may not be the best pedagogic fit and we expect to see a requirement for diversity in delivery models and technologies with these being introduced to best suit a particular curriculum and audience.

We will maintain a watching brief on emerging technologies and review the uptake of established solutions while working closely with colleagues in Teaching and Learning in supporting staff in their early adoption of new technologies and in the support of their professional development in the effective and efficient use of the established teaching and learning tools.

We will continue to review the learning technology support environments in the context of underpinning the strategic aims and objectives of the university and its partners. This will include the institutional virtual learning environment, collaboration tools and rich media service offerings as well as the associated issues around supporting the staff in the adoption and utilisation of new educational technology solutions.

Moves into time-displaced (asynchronous) delivery will demand new technological solutions including lecture capture, high production value video artefacts and self-supporting learning objects.

Video conferencing

The learning and teaching strategy indicates that studio based VC will be the main form of teaching for the foreseeable future. The current Cisco VC bridges were purchased in 2008 and will reach the end of their useful life in 2017/18. Their current capacity is 160 simultaneous bridged connections which is being reached at busy periods of the academic calendar.

SaaS (Software as a Service) cloud-hosted bridging services have matured and are likely to provide a long term alternative to UHI maintaining its own physical bridge infrastructure. They have several advantages:

- No fixed costs or large investment needed up front;

- Capacity can be flexed throughout the year to match demand, rather than maintaining an artificial fixed capacity ceiling on premise;

- Not locked into a proprietary system so other clients (e.g. Lync and Skype) can be utilised in a bridged conference;

- Greater integration into Outlook and other calendar tools.

There will be a phasing in of SaaS bridged conferences, initially for administration meetings, with the aim of moving to a hybrid delivery model by 2017/18. This will require investment over the changeover period to cover the service introduction before savings can be made on the existing h/w

maintenance contract. It will also reduce the capital funding to replace the existing VC bridge hardware.

We will continue to develop alternative desk top VC options such as Skype for Business and integrate these into the mainstream VC environment where possible.

VC studios

There are approximately 200 VC studio endpoints in use across the partnership. 60 of these were upgraded by the Next Generation Video (NGV) project between 2008 and 2010. There has also been significant investment by some academic partners, particularly Argyll, in new studio equipment e.g. Cisco SX10 and SX20 studio units to replace Jabber client workstation installations.

From 2014/15 the NGV funded VC studio codecs were taken off maintenance and the saving put into a rolling replacement programme. However, the remaining studio components (e.g. monitors, control panels, amplifiers and cameras) were all purchased at roughly the same time and we expect to see an increasing failure rate over the next few years. Monitors have also evolved technologically over the last few years, with modern units being lighter, larger and brighter while dissipating much less energy and hence waste heat.

Lecture capture

Separately from VC renewals, there will need to be a program to install "lecture capture" HD cameras in the teaching spaces to provide better revision materials and learning objects for students, and video storage and management facilities to curate the resulting materials. Given the university's geographical spread investment in this area will be higher than a "normal" university where there would be lots of activity from a small number of teaching spaces.

Accessible data analysis tools

We will introduce next generation business intelligence tools, intelligent questioning and machine learning services in the cloud bringing a low cost of entry consumer experience to high performance computing (HPC) statistical analysis power.

Assessment and feedback

Formative assessment tools and services can help support students navigate effectively through adaptively released content and where appropriate identify remedial and auxiliary content to support remote and distance learning.

Summative Assessment and Proctoring Service support needs to be investigated and understood in the context of the university regulations and appropriate solutions found to support out of region assessment and regional delivery within the Highlands.

Formal feedback processes for assessed work may require additional offerings to ensure that user needs are catered for. Audio and video feedback as well as inline annotation are all potentially valuable tools in ensuring quality feedback is provided to students studying at the university. Rich media feedback maybe especially useful where the native language in not necessarily English.

Learning content

A need to service students from diverse cultural and linguistic backgrounds may require the addition of repository support to facilitate the appropriate inclusion of learning content to established learning outcomes and pathways that are tailored to a specific student audience. In addition, the adoption of externally produced learning materials and open publishing of internally produced content may require version control and quality monitoring protocols which are best achieved through a formalised production process orchestrated through a content repository work-flow.

Learner analytics

Further integration of the various components of the service catalogue will facilitate the development of a more cohesive set of learning and teaching tools and allow students to move seamlessly between applications and resources. This integration will also provide valuable tracking opportunities in support of basic learning analytics and reporting. Exploitation of log and user data will help to direct future resource allocation and service improvements.

Exploiting the cloud

Cloud computing services including infrastructure, application and storage will provide the opportunity to expand existing services and meet academic 'seasonal' peak demands without requiring further investment in local hardware. A significant move forwards will be the opportunity to link a wider range of user desktop/mobile services into the mainstream institutional offering e.g. video conferencing linked to Skype for Business, Skype, desktop conferencing etc. providing a single collaborative audio visual experience across a wider range of applications.

The increased use of rich media in supporting online and remote delivery have placed new burdens on institutional storage capacity and highlighted policy and compliance challenges for the university.

In addition, reuse of digital learning objects, scanned materials and resources have introduced other compliance issues. These require a balanced approach between what is needed for business and what can be supported.

Tailored development

Support for small scale and bespoke projects may be key to providing the best technological solution for a given curriculum and user base but this needs to be managed and controlled through Faculty with close liaison with the Learning and Information Services department.

Library Management System

The university is a member of the ROWAN partnership which shares the costs of the library management system (LMS) and library systems manager with two other institutions (University of the West of Scotland & Scotland's Rural College). The latest version of the LMS is a significant upgrade and will trigger a procurement process in 2016/17 due to its value. UHI is also participating in the Scottish Confederation of University and Research Libraries (SCURL) shared LMS procurement project.

A1.3 Make it easy to communicate and collaborate within and outside the university

Office 356 (email, OneDrive, Yammer, Skype for Business, My Sites, Team Sites)

There is a need to make data more accessible and facilitate collaborative working, both internally and with external partners. The cloud hosted offering for email and collaborative working needs to be further exploited to ensure the best possible student and staff experience on and off campus, including cloud-hosted data storage (OneDrive for Business) and use of communication, collaboration and social tools such as Skype for Business, SharePoint (team sites and records management) in the cloud and Yammer. This will reduce the need for on campus data centre storage thereby saving on power and future hardware purchase.

Phones

The telephone system, including voicemail, is now 17 years old and although the software is up to date there needs to be some significant work to move towards an integrated unified communications solution across desktop, mobile, email and VC services. By 2017/18 the phone system will cease to be fit for purpose and significant investment will be required in either a new system, or further upgrades to both hardware and software for the existing system over the course of 2016/17 and 2017/18.

- Major investment required in the phone system/unified communications platform in 2016/17 and 2017/18

Accessing help

Smart kiosks in libraries and labs will be introduced to give access to remote subject librarians or service desk professionals.

Work and print anywhere - single managed print solution for the partnership

Follow me printing, print from Wi-Fi and online printer credit payment facilities will allow people to work anywhere/print anywhere, bringing more security and less waste for staff and students.

A1.4 Make connecting to our services easy and reliable.

Ensure the majority of ICT services are accessible on any commonly available device either on or off campus and connecting to the University's BYOD Wi-Fi service is effortless. It is our ambition to extend the university's Wi-Fi service, in partnership with other organisations, out into the community, connecting public spaces to the institution.

We will make it easier to access UHI services such as online course applications or public access eResources through other validated identity providers like the mygovscot citizen's portal.

ALLOWING PEOPLE TO "WORK SMARTER" THROUGH OPTIMAL USE OF DIGITAL TECHNOLOGY.

A2.1 Enhance self-service and out of hours support

To provide a point of presence, both in person locally and online for students and staff to get support and assistant in using ICT Services. Invest in better service desk technology, including self-help, synchronous chat, guides and social media to ensure that ICT and its impact on the university is communicated and accessible to students and staff. To provide self-help and a knowledge base with easy to find information on how to use the ICT services across the partnership's campuses.

- Review the helpdesk software in 2016/17 to be able to provide increased self-support/self-healing functionality, and which could also be applied across of other back office service area functions;

- Enhance the range of services offered by NorMAN to ensure best value and increased range of out of hours services such as VC support and pro-active fault reporting;

- Develop further support channels such as chat facilities, kiosks and expanding remote solutions to bring the experience of an ICT technician to remote students;

- Develop proactive monitoring of services to allow intervention before, or immediately after an issue is detected.

A2.2 Build capacity to deliver digital first

Move away from managing things to managing services by building the capacity and the service development skills to look at new service offerings and how best to deploy these.

Develop common ICT core skills and online learning over and above just educational requirements. Embed assistive technology and a usability test harness into all of our digital platforms to ensure accessibility to all.

- Online training resources and easy to access ICT core skills to prepare students for life after UHI;

- New, simplified approach to offering guides, help and information to users;

- Skills and capacity to be digital first.

A2.3 Embed customer service as a cornerstone of ICT service management

Utilise industry standards, customer relationship management (CRM) and proactive care to help develop our services through engagement with our customers. To listen, be accountable, and to actively look for feedback of how services can be provided and improved.

- Ensuring ICT is represented and visible to students and staff at forums, college life to ensure ICT is seen as an open door department. Engaging in college activities to understand users;

- A skills identification and gap analysis for ICT staff and subsequent development using a recognised framework e.g. SDI, ITIL;

- Problem management: to review trends in ICT requests and faults to address underlying issues etc.;

- Transform the ICT service introducing the new roles and skills necessary to deliver a modern and relevant ICT service.

A2.4 Gaelic interface for accessing ICT services where practical and possible

Being cognisant of the responsibilities placed on UHI and its Academic Partners in accordance with their Gaelic language plans and ensuring that bi-lingual requirements are considered in future procurement and development of services.

DEVELOPING THE DATA NETWORK CAPACITY TO MEET INCREASING DEMANDS.

A.3.1 Secure the next generation data network

WAN

Our existing WAN contract ends in April 2016 and we will procure a new service from the Scottish Wide Area Network (SWAN) framework. This delivers services from a range of carriers and will take advantage of the HIE/BDUK funded Next Generation Broadband (NGB) / Next Generation Access (NGA) rollout across the Highlands and Islands of Scotland, due to complete in December 2016.

It should be possible to achieve greater bandwidth at the majority of our larger sites during 2016 while remaining cost neutral on existing contract costs through the greater availability of capacity and a reduction in bandwidth costs. As other services become available it may be possible to upgrade some of our smaller sites if connectivity has been delivered in that area. During the changeover period from one supplier to another, additional costs will be incurred to guarantee continuity for service. It may be possible exploit future shared services offered through SWAN to provide better connectivity with partners such as the NHS.

LAN

Contingent on funding there will be a LAN refresh to bring all academic partners up to a common standard, including network intrusion protection. It is to be expected that there will be a further refresh needed within the lifetime of this plan, as this class of equipment has a life of around 5 or 7 years due to technology evolution.

Wi-Fi

Simplify the experience of using the Wi-Fi service making it easy to connect and access the applications and services staff and students need on corporate and BYOD devices. The current Wi-Fi infrastructure was put in place 5 years ago, and due to rapid technological evolution in this area – the now ubiquitous iPad did not even exist when the system was specified – the current access point technology is now approaching end of life. A refresh in 2016/17 will be required to provide the latest Wi-Fi protocols which have been developed since the system was installed, and to continue to build system capacity to track the enormous growth in user devices and demand for the service.

A3.2 Provide a safe and secure ICT environment, compliant and cognisant with latest ICT security best practices and threats.

Continue to review our information security management system and associated policies based on ISO/IEC 27001 standards, to safeguard the confidentiality, availability and integrity of systems and institutional information. To react appropriately to security incidents raised and ensure ICT is supported and implemented with a focus on information security.

Provide a safe and secure environment with help and advice for a wide range of students, with differing needs, to effectively use the university ICT services without unnecessary barriers.

A3.3 Increase resilience to minimise disruption

There is currently limited or no resiliency on most of our links to academic partners. The NGB roll out offers the potential to invest in diverse routing to maintain service during network incidents. SWAN will provide an opportunity to review the relationship between 'on-campus' data centre services, cloud hosted services, and data flows between users and each of these. It may be possible to enable much greater access to university systems and services for users based off-campus, and make on-campus sites less dependent on university infrastructure.

A3.4 Open data for research and institutional requirements

As research activity increases the regulation and responsibilities placed upon us by funders will mean we will need continued investment in research information and management services. We will also need to provide greater specialist support to researchers in sourcing and supporting their IT equipment and how they can access HPC and other data analysis services. There will be a significantly increased requirement for long term data storage, curation and archiving. Rather than build this capacity ourselves it is envisaged that we will utilise a cloud or shared service provided by another university to fulfil this need.

OPERATING AS EFFICIENTLY AS POSSIBLE BY REDUCING DUPLICATION AND DIVERGENCE AND MAXIMISING COMMON SOLUTIONS AND STANDARDS.

A4.1 Consolidate onsite data centres and exploit developments in efficient server technology and cloud services

The university runs many of its services in a distributed virtual computing environment that allows the efficient use of storage and hardware. This saves many tens of thousands of pounds on power, hardware maintenance and simplifies its management and deployment. It also provides effective resilience in the event of a single site failure. There are also similar virtualised server deployments, although of a lesser scale, at many of the academic partners. We will further consolidate these server platforms, and so improve asset utilisation and reduce replacement, power and maintenance costs.

We will also be seeking to reduce capacity across the entire estate over the next 5 years as connectivity and resilience improves, allowing the university to fully utilise cloud based application delivery services and offsite data hosting.

A4.2 More efficient environmental control and utilisation monitoring of ICT assets

Provide effective reporting against SLAs and budget as well as monitoring of system performance to identify issues and feed into capacity planning and resource reallocation. Effective asset management and procurement processes will require all assets to be identified, profiled and recorded to enable age profiling and determine renewal schedules.

Maximise energy efficiency through choice and installation of hardware, energy monitoring and optimal temperature management of data centres.

A4.3 Move from capital infrastructure to revenue based services

Increasingly ICT is being delivered through subscription services rather than traditional upfront capital investment in on-site hardware or locally installed software. With the improved data links as a result of the fibre roll out across the region, the university will be able to greater utilise cloud based services and provide increased resilience through diverse routing. This will result in a general move away from capital funding into revenue subscription based services, leading to an increase in the operating revenue budget of the ICT service.

A4.4 Collaborate in regional and national shared service initiatives

We will continue to monitor and take advantage of other initiatives that will deliver value for money for the university as and when they arise. Current shared service activities include:

- University of the Highlands and Islands is a member of the ROWAN partnership which shares the costs of the library management system and library systems manager with two other institutions (University of the West of Scotland & Scotland's Rural College);

- The next generation WAN will be procured using the SWAN national framework;

- We will continue to use the NorMAN Helpline, a sector shared service, for the provision of our out of hours service:

- Implement federated access using the mygovscot myaccount[1] validated identity to allow citizens to access our services and make it easy for them to become students.

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[1] [Login page for mygovscot account](#)