

The Think Tank: Anytime, Anywhere Computing



Security – it's the Director's Priority!

Authentication and control...needs to be seamless for the end user

Security and authentication policies should be tied together

How far does support go? What are user expectations?

What responsibility does the institution have for non-owned equipment?

Authentication is the key!

Home access used to be email, file transfer. Now users want everything!

Introduction

Delivering 'Anytime, anywhere computing' was identified as the top concern in the UCISA Top Concerns survey of 2005. Delivery is a difficult balancing act - staff and students require access to office tools and applications, filestore and business applications from a variety of devices and locations (mobile phones, PDAs, laptops as well as home desktops). Service heads have to try and provide this securely to protect their institutions' assets, but in a way where authentication does not compromise ease of access and where managing connectivity does not come at the cost of a heavy demand on resources. Governance and security issues require appropriate policies for remote use of corporate information and applications, particularly on systems that may not be owned by the institution, and maintenance of security patches and antivirus software on remote systems add to the complexity. The growing use of mobile devices, increasing student ownership of 'cutting edge' devices, growth in the use of online learning and demographic changes in the student body have all contributed to systems resilience and availability becoming the major new concern for IT Directors. The expectation that services, particularly e-learning, are available 24x7 brings new demands - achieving this is a significant investment in infrastructure and maintenance and operational resource. Network security continues to be a concern - although many institutions have external antivirus and spam filter mechanisms in place, there is often a threat from within from poorly maintained systems.

A Managers' Forum on the topic was held in November 2005 to give insight into how some have addressed the issues and problems involved in delivery as well as taking a further look at what the future might bring. As part of this event a 90 minute 'Think Tank' session was held and the outcomes of these group discussions are represented here.

What are the key components needed for anytime, anywhere computing?

Many of the components discussed by the groups hinged on aspects of **security**, covering network security, encryption, identity management, authentication (user and device) and access control. It was felt that strategies and policies were needed, or existing ones amended, to lay down a clear model which balances the requirement to achieve a secure environment with a seamless service for the end user in terms of ease of use and connectivity. Security and authentication policies should be tied together, whilst also covering both internal and external access. Questions were raised as to how third party devices could be covered by such policies. Extensions of Virtual Personal Networks (VPNs) into the campus raised some concerns.

For laptops and handheld devices a key requirement was that of a predictable and reliable **wireless network** – a number of delegates commented on connectivity issues such as coverage and variability of signal strength.

Support was also high on the list of all groups – discussions included managing customer expectations of support, the challenge of moving to 24x7 support, range and level of devices to support, and user education and training. Aside from resource implications, 24x7 support requirements were felt to be increasingly expected by customers while at the same time causing potential problems in reducing available maintenance windows. Questions were also raised about whether to provide support equally irrelevant of accessing location, or whether ‘premium’ support would be offered on-campus only – after all, what responsibility does the institution have for non-owned equipment? In any event, there was a strong feeling that user education, training and advice should address risks of connection (for example ensuring antivirus software is up to date), device security and safety. There was a consensus that the way to go was to encourage self-support and self-management of devices, to reduce the support overhead on helpdesk staff. Other aspects of support were expectations of file synchronisation between mobile devices and the network and similarly backup facilities for remote work.

A related issue was the **range of devices** that it was felt to be manageable to support. A number of groups favoured the catalogue approach whereby a limited number of devices were recommended for purchase (perhaps with incentives) with guaranteed ‘full’ support. It was acknowledged however that customers, in particular students, may arrive with differing kit and that partial support should still be made available in terms of required access to applications. Policies need to clearly state which devices are fully supported, which are partially supported and which are unsupported.

It was also recognised that some existing services may never be enabled for full anytime, anywhere operation – e.g. thick client applications which will never be web-enabled. New services and applications should have mobile access requirements built in at the specification stage prior to procurement.

Another widely-raised area was that of **applications access** – what is needed, by whom, what for, and within what parameters? In particular here it was felt that staff needs would differ from student and visitor requirements. Staff may require access to corporate information systems – although this raised questions about feeding corporate information into non-University devices and areas of ‘sensitive’ data – and not all staff needed access to all business systems. Across all groups the minimum access requirement was thought to be filestore and email, for students, academics and some support staff this was expanded to include the learning environment. It was noted that access needed to be determined on a role basis (e.g. staff who were also students).

Discussion took place in a number of groups on the general nature of remote working for staff; that it was not a purely technical issue but needed management buy-in and supporting human resource policies and guidance for it to work effectively. Policies were noted to be ad-hoc at present even though a fair degree of

How many devices each do we need?

Awareness/existence of remote working policies appears to be scarce with ad hoc arrangements in some places

There’s a big issue of trust around remote working, monitoring off-site working – are you doing a full day?

The emphasis is on effectiveness rather than time spent sitting in front of a computer – it’s about outputs and getting the job done

Remote working is not a specific IT issue – it’s more about management. IT can offer the technical where-with-all but it’s management will that’s important

Staff and students are geographically spread so it's important to have more creative and practical approaches to working

Implications of international boundaries are different

Obsolescence occurs quickly – it's more important to have a device independent system – based on web

Increasing bandwidth for falling cost

Bandwidth problems can be overcome but screen size is a problem

In 5 years' time will there be a distinction between handheld and laptop?

remote working was taking place. Staff and students are geographically spread so it's important to have more creative and practical approaches to working. Remote working should add value, and ease scheduling and transport difficulties. However a big issue of trust still surrounds remote working. The emphasis shifts to effectiveness in terms of output rather than time spent sitting in front of a computer. It was suggested that working remotely is more common in IT firms and IT areas, it's not generally widespread in other departments and areas of universities. Perhaps the practice is more common in the commercial rather than the academic arena? Attitudes vary – but expectations are increasing, particularly from new staff migrating in from the commercial sector. New methods of working have implications for terms and conditions of contracts and other areas such as health and safety (training, legal and regulatory frameworks). Mobile working could also be used where a user wished, for example, to move to a quiet environment.

What services do you anticipate being delivered over mobile devices in 5 years' time?

This question was originally phrased with the additional requirement of grouping answers into 'all devices', 'laptop' and 'hand held'. However, a significant amount of discussion raised centred around the notion of multiple-function devices – i.e. over time the number of devices we use will decrease, with more functions packed into single, smaller devices. Even now there are blurred boundaries between laptop and PDA functionality. The consensus was that both devices and services would continue to converge – satellite navigation systems were quoted as an example.

A great deal depends on practicability of use – for example PDAs may provide read access to corporate information systems, such as an administrator looking up a student record, but this does require some 'transformed' output (such as a simplified form accessed via a portal – more than web-enablement) in making this accessible – and it is unlikely that wholesale data input would be actioned via a PDA. However an interesting point about the shifts between generations was made – we may find screen and keyboard size a problem for current hand held functionality (or have to supplement with folding keyboards for example), but will the next generation as they'll have been brought up with it?

Generally the feeling was that we should be heading for the same level of access via mobile devices as with wired desktops – with the earlier caveat raised about legacy thick client applications. This was particularly so for laptops – if connectivity issues could be ironed out there was no reason that laptop services should not match those of desktops. Some areas which were already available via mobile devices – such as email and calendaring services, workflow and web browsing – would likely see increases in usage and functionality. Smaller mobile devices, including mobile phones, were thought likely to have more features and functionality but still not be the 'norm' for access. What should not be delivered over wifi or to remote laptops depends on security and encryption.

Across all devices it was thought that we will see rapid expansion of interactive technologies such as video on demand and generally enhanced video and audio services. Within the groups there was still a feeling that laptops were primarily the tool for content creation and hand held devices would increase their ability to view both text and multimedia output. Bandwidth is becoming less of an issue as capacity is increasing at falling cost, although some participants raised ongoing issues with upload speeds.

A number questioned whether the PDA is currently an effective teaching and learning tool – the feeling seemed to veer towards ‘no’ at present but it is for the management of learning – for instance for timetabling issues – “Your lecture is cancelled” “Your lecture room has moved” etc. These SMS-type services were thought to be very useful but currently underused. Some subject areas lend themselves more readily to digital media: there are limitations to what you can do digitally to replicate physical things – you may not be able to replicate sculpture experience digitally for instance. Technology can support subjects such as this but it cannot fully replicate all areas involved. IT can be used to support fieldwork – and this is happening routinely with the use of video cameras and laptops for instance. In 5 years’ time hand held devices may be used to capture text, video and audio in situ and then transmit this back to the network. More flexible use of buildings and estate can be achieved as we head towards a mobile/remote approach. Development of the mobile approach depends on developing the teaching approach generally; software can simulate some situations but discussion fora on learning environments don’t replace real lectures – and shouldn’t. It was strongly felt that technology should be used as a complement rather than a replacement, with mobile technologies in particular offering more sophisticated use of learning tools. Students want and expect more flexibility of delivery.

IP telephony services were felt to create the biggest explosion in the services market in the next few years, delivered via softphones and emerging dual mode devices. On a related note, it was commented that speech recognition was now a closer reality than 5 years ago – speech in and speech out services will change the nature of devices.

Factors that will affect the evolution of devices and thus which services would be taken up were also touched on, such as price, proprietary software and battery life. Obsolescence occurs quickly and the onus should be on supplying device-independent services – most likely in the short-term to be based on the web. New services and applications should have remote/mobile requirements built into their criteria for procurement. Even now, one institution explained how their future capacity was assumed to be met by wireless – refits requiring wired data points were only being specified to current capacity with additional capacity assumed to come from wireless device connection.

Another consideration is the increasing mobility of students. Already students registered in one place are actually geographically based

Need to take account of user needs and technology alienation

If personal equipment is used what rights of investigation do we have?

Students will increasingly expect mobile access

More flexible use of buildings can result if the whole mobile/remote approach is enabled

Remoteness versus face-to-face contact - we shouldn’t eliminate face-to-face as it can’t be replicated exactly

Technology/mobile learning should be used as a complement rather than a replacement

Students may not be restricted to an individual institution

..a mix of virtual and actual approaches will help forge the character of an institution in the future – giving students the mix that they want

The expectation of young people today is likely to be that they will have a 'portfolio' of careers rather than a lifetime career

The driver should be the teaching not the IT – but it's chicken and egg

It's hard to comply or keep up to date with changing standards

Major issues for reliable signal coverage - is this going to be an issue in 5 years' time?

Policing wireless may be a problem

somewhere else; with the run-up to the introduction of the European Higher Education Area in 2010 this will be increasing. It will become more common for students (and staff) to move more flexibly between institutions. It was commented that the expectation of students today is that they will have a 'portfolio' of careers rather than a lifetime career – increasing levels of mobility and flexibility are likely to be viewed as the norm by graduates.

What barriers are there to delivering such services now and in the future and what do we need to overcome the barriers?

A number of issues raised in the previous discussions were put forward as potential barriers to developing anytime, anywhere services. Discussion centred mainly around current barriers and ways in which they may be alleviated – as the area is very dynamic it was felt difficult to predict the level of advancement that may be made in the medium term.

Signal coverage was mentioned by a number of groups as an area that needed improvement – in particular there was felt not to be economic delivery of 3G/mobile telephony services currently, and devices such as 3G datacards were not thought to be as efficient as they might be.

Current policies which were not 'mobile-compliant' were felt to be a potential barrier, although these should be amended or added to now to accommodate required standards, including health and safety policies, contractual terms and conditions for staff and device catalogue considerations. It was proposed that device catalogues should be more a list of capabilities and standards rather than keeping up with hardware. Another current barrier that was mentioned was inappropriate estate and outdated learning space configuration.

Standards generally were felt to be required, although these were not without their headaches and could, it was suggested, form barriers of their own if not carefully considered as they could inhibit change. These included standards about hardware, software, services and support (and expectations of 'self-help'). Security standards could be addressed, with a number of groups suggesting that the UCISA Information Security Toolkit be used for this purpose. However, institutions will need to decide what they want to protect and why – this will vary depending on the customer base (staff, students, international access) and institution. There was considerable agreement that 'one size did not fit all' in terms of security, and that security should reside in the network rather than within devices.

Incompatibility issues across operating systems and different devices could become an issue - whenever something new comes along the existing kit is added to rather than replaced, so this means that there is an increasingly diverse collection of things that require support. Service and device catalogue approaches could help alleviate this, but this increasing diversity could lead to greater difficulty in tracking down problems. One group commented there was not yet an indication that students favoured the use of their own equipment over the institution's although this didn't

appear to be the consensus.

If the machine belongs to the student rather than the institution there are implications for campus licensing agreements – and these can be very costly. However if there were enough institutions going in this sort of direction then the sheer scale of it could encourage software companies to revisit their costs and revise policies accordingly.

Culturally, there can be real resistance to an initiative that is seen as 'IT'. A need to get senior management buy-in was identified so that technology is seen more as an initiative that supports the strategy as well as the operation of an institution. It was also felt important to arm senior management with the knowledge to support decision making on IT areas.

What emerged during the last set of discussions were not so much purely technical barriers but a range of issues relating more to organisational culture.

The drivers for technology were felt to be 'chicken and egg' in that it should be the teaching driving change not the IT. As teaching practices change this could remove barriers as the technology is used in increasingly sophisticated ways. An example was quoted of students making personal use of mobile devices in lectures rather than paying attention to the speaker, however is this any different from staring out of the window or writing on desks? Would increased emphasis on tutorials and seminars, assessing the students' use of resources lead to the diminishing role of the lecture? As well as teaching practices changing the culture of the institution, students themselves are becoming more discerning customers with higher expectations of support. The digital generation now entering university will expect anytime, anywhere computing. There was a suggestion that in a lot of cases it's the staff that need more IT training than the students. This may add to the 'fear factor' that some staff feel as they try to keep up with the technology.

Peer group support should be encouraged –there were positive experiences of student advisers in halls of residence for example. Peer support in some areas was not necessarily formally encouraged currently but it happens informally anyway. Other institutions hold clinics in halls where technicians are available. Knowledge of the user was felt to be as equally important as knowledge of the technology.

Another emergent theme was that of collaboration, either with other institutions or external organisations such as local MANs. Such collaboration could realise services such as helpdesk support more quickly and effectively – particularly if collaboration was with partners in different time zones to offer the 24x7 support sought. An example of creative ways in which wireless areas are being set up was given as schools setting up a wireless environment in local housing estates so that their pupils can log on from home. One group suggested that a similar 'JANET from home' service could help progress the anytime, anywhere initiative. It was further noted that to optimise the potential in this area we need to be working together not against each other.

Although there are cost implications of all of these initiatives there is real potential for

Need to make roaming easier, make technology invisible

One-size security does not fit all

Self care – cut down helpdesk calls, take onus away from support regime

We need big wins for low cost – what will need supporting? How do we spot the winning technology?

Texting is huge here but not in USA

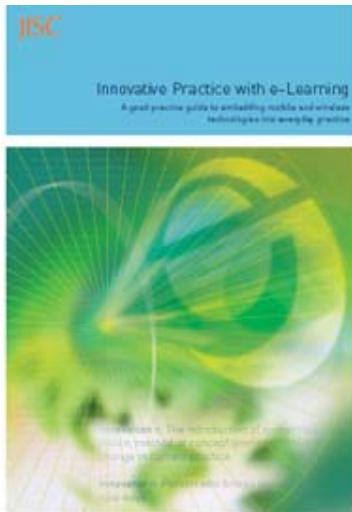
Collaboration with other universities for support could be the way forward

Skills levels change with every new cohort of students – staff may need more IT training than the students

There is a fear factor for some staff

savings – especially with regard to redesigned physical space. One final observation from a delegate was that an institution who could grasp the issues surrounding this whole debate could really pull away and become leaders in the field if they play it well – there are great opportunities as well as risks.

The Think Tank was held as part of the UCISA Managers' Forum on Anytime, Anywhere Computing at Sadler's Wells, London on 24 November 2005. The programme and presentations can be found at <http://www.ucisa.ac.uk/events/2005/forum/atawc/Programme>



Also available:

JISC Innovative Practice with e-Learning

'Innovative Practice with e-Learning' is a good practice guide to embedding mobile and wireless technologies into everyday practice which is aimed at practitioners and managers in further and higher education and adult and community learning. This publication builds on the case study approach adopted in 'Effective Practice with e-Learning' to explore ways in which mobile and wireless technologies have become established in post-16 and higher education institutions.

The publication contains a supplementary CD-ROM which contains extended versions of all ten case studies, video clips for five of the case studies, an e-learning audit tool, and planning tools for use of mobile and wireless technologies. These have been designed as separate downloadable tools for use by institutional managers, e-learning managers or practitioners.

To order your free copy of this publication please email us at jiscinfonet@northumbria.ac.uk

Ongoing Developments

For further information on the JISC e-Learning and Innovation programme visit <http://www.elearning.ac.uk/innovation>