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Author: Ant Harrison, NCC Group
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Issue

An IT Strategy for the University for the period 2012 - 2017

Recommendation

The Committee is invited to endorse the Strategy, recommending its adoption to the Executive Team.

Resource Implications

The Strategy has many resource implications, set out within the body of the report.

Equality and Diversity

New services arising from adoption of the Strategy will be the subjects of Equality Impact Assessments as they are implemented.

Timing of decisions

The views of ISSC will be required by the Executive Team when it considers the Strategy.

Further Information

Enquiries about the content of the paper should be addressed to Jonathan Colam-French (j.colam@uea.ac.uk) – ext 3858).

Background

The Registrar and Secretary instituted a review of the University's IT Strategy. The NCC Group was engaged to assist with this task, and conducted wide-ranging consultation at the University, regularly reporting to the Registrar's IT Strategy review group. Their report follows.

Discussion



University of East Anglia IT Strategy: Summary Report

Prepared by:

Ant Harrison

Tel: +44 (0) 161 209 5310

Mobile: 0785 472 7005

e-mail: anthony.harrison@nccgroup.com

Business Assurance

NCC Group plc

Manchester Technology Centre

Oxford Road, Manchester M1 7EF

Tel: +44 (0) 161 209 5310

Fax: +44 (0) 161 209 5400



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Author: Ant Harrison

QA: Alastair McGowan

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1 Introduction

1.1 Background

This summary report is intended to reflect the presentations to, and discussions with, the IT Review Board which have taken place in the period January to April 2012.

It summarises the University's suggested IT strategy for the period 2012 – 2017. The strategy has been produced as the result of a number of factors including:

- The expiration of the current ISD strategy which was planned to occur in 2013;
- The implementation of the new corporate plan which sets-out the University's ambitions for the coming years including in relation to growth of student numbers, the continued production of world-class research, achieving financial stability, improving the employability of graduates and developing the careers of its academic and support staff;
- The need to build confidence amongst the executive team (ET) that IT delivers sound value-for-money;
- The need to gain a better understanding of the current levels of resilience and ability to respond to issues across the IT service following the network failure in 2010 and
- Emerging potential to develop shared service approaches with other partners such as NRP and other local institutions.

The primary objective of this report is to set-out recommendations and a work-programme to be delivered over the coming years which will ensure that the University extracts the maximum value possible from IT and the investments it makes and supports the development of the corporate plan.

1.2 The process we followed in developing the strategy

This strategy is based on three key themes:

- The current position - which sets-out where the University is placed in relation to its IT services and facilities;
- The desired future position - which sets-out where the University needs to be over the coming years and how IT is able to assist in this being achieved; and
- The key actions and investments that will be required to move from the current position to the desired future position.

To support these key themes we have consulted with a broad cross section of the University's management and administrative staff, teaching staff, researchers and students. In addition, we have held a number of workshops and interviews with ISD staff to gain a detailed understanding of current operations and services. These consultations have taken place in both group and one-to-one sessions.

We have also examined a significant number of documents including the current strategy, the corporate plan and the minutes of governance committees such as ISSC and the Research Board.

The strategy development has taken place between January and May 2012 and we have provided two interim presentations to the IT Review Group, which is the governing body set-up for this piece of work.

1.3 Acknowledgements

We would like to thank the University for its assistance in developing this strategy. We are particularly grateful to those we have interviewed and have provided insight into current and future needs and those who have overseen the governance of this review.

2 Current Position

In this section we set-out the current position in relation to IT services and facilities, focusing on user views, the organisation of ISD, IT resilience, IT governance across the university and the key opportunities for improvement.

2.1 An Overview of IT at UEA

The University's IT service is provided by the Information Service Division (ISD):

- IT related activities are provided by 115 of ISD's establishment of 197 staff with the remaining staff working on library services;
- ISD has an annual revenue budget of approximately £12.5m which includes IT and library services;
- The annual IT revenue spend is around £6m with a further £1.1m capital spend;
- The IT service support around 500 servers, 6000 desktops and almost 600 Tb of disk storage (of which the vast majority is provided for research purposes); and
- The underlying infrastructure is mainly of a traditional design comprising dedicated servers and workstations and there are opportunities to move more towards a virtualised infrastructure which is easier to support and provides better scale economies in resource usage.

2.2 User and ISD views

Our consultations have taken place with the following communities represented in the University:

- **Students** – those studying at the University. We were keen to understand student satisfaction with IT and to obtain views on future requirements.
- **Teaching and academic staff** – those responsible for teaching, or the managing the teaching of, the University's students. This was achieved through meetings with the IT Forum and specific workshops with, for example, staff at the forefront of technology enabled teaching.
- **Researchers** – those responsible for managing and delivering research across the University. We met with several groups of researchers including those undertaking post graduate research.
- **Management and administrative staff** – those responsible for the strategic and operational management of the University. Some of these consultations were through specific meetings and workshops such as Deans and Directors of University Services and others were as a consequence of the mid-point reviews held with the IT Review Group.
- **ISD staff** – those responsible for the management and operations of IT across the University.

A wide range of views were expressed during user consultations. The following represents the positive views which were provided:

- There is a generally satisfactory operational IT infrastructure – IT generally works as it should for most users and is reliable;
- Refresh cycles ensure modernity for central IT (but this does not extend necessarily to research funded IT);

- There is good desktop provision to students and wireless provision is highly utilised;
- High performance computing (HPC) facilities are well regarded;
- Significant resources are focused on business projects such as SITS and web development;
- Some best practices in place in relation to technology enabled teaching (some use of Blackboard, lecture capture etc.) but in our view this exists in pockets and is not sufficiently widespread across the University. Students experience of online learning tools, such as Blackboard, varied from poor to very good;
- Students were generally satisfied with the IT facilities available to them on campus;
- Students rated highly the access to electronic resources such as research databases; and
- Students did not see a need for UEA to provision IT equipment specifically for individual students. However, students would welcome additional support in providing good value equipment (laptops and printers), access to software, provision of repair and loan facilities, Wi-Fi provision in UEA accommodation and an inclusive printing quota.

Our consultations also identified a number of improvement opportunities including:

- There is a perceived high level of bureaucracy surrounding IT especially in relation to limiting access rights and equipment provision;
- There is widespread discontent amongst staff, particularly researchers, with the loss of administration rights and, for those recently migrated to the central email service, the imposition of email quotas;
- The standard managed desktop is judged to be inflexible for some researchers;
- Communication from ISD can be weak in such areas as help desk feedback and progress monitoring;
- IT governance processes largely ignores benefits realisation;
- The service delivered by the IT helpdesk is poor. It is fractured and user satisfaction is low;
- Blanket security measures are perceived to be in place and these are felt to be detrimental by staff, in particular researchers;
- Best practices (e.g. Blackboard) not always shared effectively across the University;
- No expectation for IT's performance – there is no service level agreement covering such areas as availability and responsiveness;
- There is a perception that ISD only support a one size fits all approach to the delivery of IT services – including security and software provision; and
- Issues with day-to-day operational IT provision divert attention from strategic thinking.

The research community representatives we met were generally dissatisfied with IT provision in relation to agility and capability. The extent to which this represents the views of the wider research community is unknown but it is fair to say that this community was the most frustrated of those we consulted.

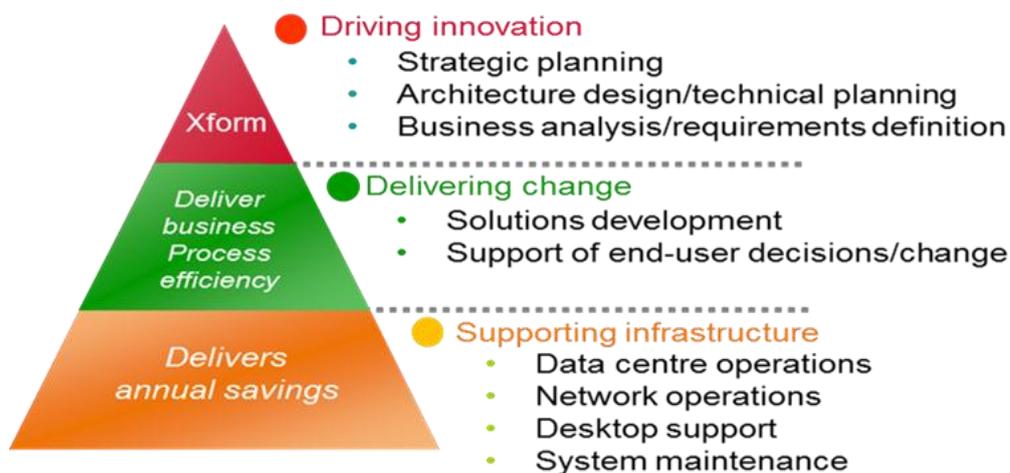
Our workshops and interviews with ISD staff were generally positive:

- They recognise the need to:
 - Facilitate rather than define;
 - Support innovation; and
 - Support the website and corporate branding;
- Support variability of client equipment and personally owned devices;
- Provide 24/7 support (but funding will be required to enable this); ISD recognises opportunities for shared services with international partners as the University expands its partnerships across the globe;
- They want to engage better with research community especially in relation to data storage; and
- See opportunities for greater collaboration and use of cloud based tools such as storage and office suite provision

2.3 The Organisation of ISD

When we examine an organisation's IT capability, we focus on three key areas:

- **Supporting infrastructure:** The "Engine room" of IT focusing on data centre and network operations, systems maintenance, service desk and fault resolution. These elements of service should be automated to the maximum level to drive-down cost and increase efficiency and service performance;
- **Delivering change:** Enhancing and developing systems to deliver business benefits and managing programmes and projects; and
- **Driving innovation:** Ensuring business alignment, undertaking strategic planning, developing the enterprise architecture, undertaking environmental scanning and seeking to use IT to support innovation and new ways of working.



ISD does broadly provide this portfolio of services, and this should provide some comfort to the University. It is common to find that many IT organisations are extremely operational in nature and do not provide the higher-value and more strategic services.

Our investigation of these areas found:

- The resources used to deliver and support the infrastructure are split broadly into three key areas; infrastructure, data centre services and faculty IT support. We found that the number of staff deployed on infrastructure and data centre activities is towards the low end of our expectations and in some instances the University is at risk of single points of dependence on key staff in such areas as storage management and server configuration and support.
- The resources deployed on faculty IT support are more generous and are above our expectations and we believe that this results from not yet gaining envisaged scale economies from IT centralisation and a relatively high-maintenance desktop infrastructure which is based on fat-client PCs rather than thin clients or virtualised desktops which are more economical to operate and support.
- Significant numbers of staff are deployed on delivering business change including internet and SITS development.
- There is a strategy and security group within ISD but its primary focus is on information compliance and security and we think there are gaps in relation to systems architecture and strategy and this may be hampering the design of more innovative ways of delivering IT and supporting the University.

We have the following observations on the current ISD organisational structure:

- Responsibility for anticipating user demand is embedded within senior roles of the ISD management team and there is no single and dedicated part of the structure to lead "Demand side" management such as user relations/communications, particularly with the research community. We think this is a gap which needs to be addressed to enable ISD to become closer to the user base and better understand their demands, again particularly of researchers. We think the absence of this role is one of the causes of widespread dissatisfaction amongst the research community.
- Responsibility for systems and technical is embedded in the roles of the ISD management team. The strategy function within ISD is limited to security and policy and there is a gap in relation to enterprise architecture.

2.4 IT Resilience

During 2011, the University suffered a major IT service outage following the loss of a critical network component. We were asked to undertake an analysis of the main IT infrastructure to identify any major points of weakness or dependency. We found the following:

- The University has two on-campus data centres. These are joined by two dedicated fibre links which are routed diversely. If one of these links is lost the IT service should continue to function.
- Server capacity is divided between the two data centres and there is storage in both data centres, but data is not replicated. If either data centre were lost it would be possible to resume some services but this would not be instant, and it is

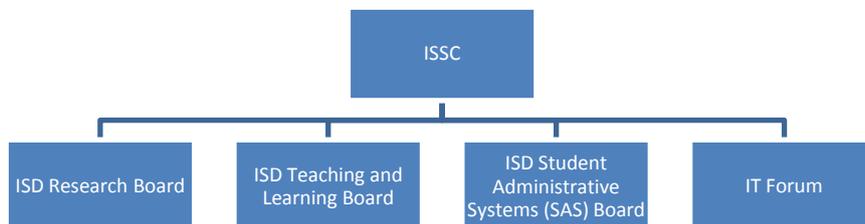
likely that at least a 24 hour loss of service would occur to restore business critical applications.

- The only server and storage components which have failover and would recover almost instantly from loss are the Microsoft Exchange (email), Active Directory and Domain Name Server components.
- The HPC is located in Data Centre 2 and if this data centre was lost the HPC service would be lost.
- Backups are performed between each data centre (tape vaulting) and there is no off-site backup kept. If the contents of both data centres were destroyed the University would lose all its data **forever**. This is a relatively easy risk to mitigate. We understand that the University's auditors recommended that this arrangement is satisfactory, but we do not subscribe to that view.
- The external internet (JANET) link is provided to Data Centre 1. If this data centre were unavailable, the University would not have external network access but there are plans to install a resilient JANET link in the summer of 2012.
- There is a single network core in each data centre. If either of these was lost there would be a delay whilst the existing spare was deployed. We note that the existing spare will reach the end of its life in the next two years and there is no budgetary allowance for a replacement.
- As noted earlier, there are single points of failure in relation to key IT staff particularly in relation to server and storage management.

The University has the opportunity to increase the level of resilience provided, but this would be at a significant cost based on the current infrastructure. Over time, and as the University moves towards virtualised technologies it would be easier to build-in a more rapid recovery from server or storage failure as server provisioning would be a logical rather than physical activity.

2.5 IT Governance across the University

The University's main IT governance forum is the Information Strategy and Services Committee (ISSC). There are other bodies which report into the ISSC including the ISD Research Board, ISD Teaching and Learning Board, the Student Administrative Systems (SAS) Board and the IT Forum.



Governance Structure

Examination of sample minutes from ISSC shows it to be operating at the level we would expect and to be concerned primarily with strategic matters.

Examination of sample minutes from the ISD Research Board has led us to the conclusion that this board is concerned primarily with the IT components of the research application and management processes rather than the IT needs of researchers. We understand that the minutes we reviewed were from a time when

there was close focus on RAE and that the focus is now moving to more general matters related to IT. This focus may be one of the reasons why there is such dissatisfaction with ISD amongst the research community as the conduit to express their concerns at an operational level does not exist.

Following discussions with representatives across the University, we make the following observations in relation to governance:

- Whilst initial investment decisions are based on good practices such as business cases, there is insufficient attention given to benefits realisation and business change.
- Many investment decisions are "Feudal" in nature (in the sense they are made from a departmental perspective) and can be made because funding is available but without following sound collective governance processes to determine if they are for the overall benefit of the University in the light of its corporate priorities.
- Governance is high-level and does not readily allow operational end-user concerns and requirements to be addressed (such as the concerns expressed by the research community).
- Some of the University's security policies are counter-productive in relation to their intention. For example policies forbid email forwarding and the use of cloud-based services such as Google Docs. So rather than provide these facilities within the University's security domain, many staff use them unofficially resulting in weaker security. In our view, the security restrictions are "Blanket" and not based on a user-based risk assessment.

We were invited to attend a meeting of the SAS Board and we facilitated discussions to better understand the scope and scale of current systems. It became clear that the University has a vast and complex portfolio of business applications containing duplicate functionality. There are significant opportunities for this to be rationalised but this would need to be based on the adoption of a set of principles to govern decision making and ensure that systems consolidation takes place.

Such principles could include those detailed in the following table.

Strategic principle	Advantages
1. No new application functionality to be deployed if it is available in a current system	<ul style="list-style-type: none"> • Supports application simplification and consolidation • Saves time and money
2. There will be a single source of master data	<ul style="list-style-type: none"> • Reduced maintenance • Greater consistency/accuracy • Less duplication
3. All data and applications will be available from everywhere	<ul style="list-style-type: none"> • Staff able to work from everywhere • Flexible working • Building consolidation • DR/BCP and resilience
4. No dependence on paper records	<ul style="list-style-type: none"> • Reduced storage space • Greater responsiveness
5. Self-service where possible	<ul style="list-style-type: none"> • Reduced cost • Reduced staff • Greater customer satisfaction
6. Web access for all applications	<ul style="list-style-type: none"> • Ease of application deployment • Common operating platform
7. Single sign on to applications	<ul style="list-style-type: none"> • Greater efficiency • Reduced support and maintenance • Greater security
8. Must be on a supported version of an application	<ul style="list-style-type: none"> • Supported by vendor • Reduced risk
9. Common applications are rationalised by making greater use of embedded functionality	<ul style="list-style-type: none"> • Better value from investment • Fewer contracts to manage • Reduced support resources • Reduced dependence on staff
10. Improved process efficiency and return on investment	<ul style="list-style-type: none"> • Greater efficiency • Greater payback
11. Explicit linkage to corporate plan	<ul style="list-style-type: none"> • Deliver corporate plan
12. Common operating environment for IT	<ul style="list-style-type: none"> • Easier to support • Easier to manage • Reduced cost • Better service to users • Shared file systems
13. Training and awareness of facilities and provision of support	<ul style="list-style-type: none"> • Skilled workforce • Benefits realised • Common processes
14. Standards that prevent loss of data	<ul style="list-style-type: none"> • Reputation undamaged • Business continuity • Reduced risk

2.6 Key Opportunities for Improvement

This section summarises the key improvements we think can be made to the current IT service. These are:

- The next generation infrastructure should focus on greater data centre virtualisation and the replacement of PCs by virtualised desktops where appropriate and this will improve the efficiency of IT support staff;
- The University should, through its governance arrangement, revisit its resilience requirements and determine if it remains content with possessing the single points of failure in relation to infrastructure, elements of ISD staffing and the decision to not have off-site backup storage;
- At a structural level IT governance is in place but it needs to focus “Beyond the business case” to ensure that anticipated benefits are realised;
- ISD should focus more attention on understanding demand through the creation of a user relations capability which listens, directs resources into required areas and manages delivery, and faculties and schools must be prepared to pay for their demands being satisfied;
- Expectations for the performance of ISD should be captured in a service level agreement and this should cover such areas as help desk performance, system availability and user satisfaction;
- The IT help desk needs to be improved to improve user satisfaction, resolve problems within agreed deadlines and improve the overall perception of the IT service;
- Security should be based on a risk assessment rather than the imposition of blanket controls;
- The University should develop a strategy in relation to core university administration and student administration systems and business processes so that these can be consolidated and simplified;
- Communication about IT and how it can help all communities should be spread based on best practice, but in many instances this will not be ISD led (e.g. Blackboard is L&T led);
- The University's policies in relation to DPA and FOI are not supported through automated tools and this will require investment in underlying software infrastructure such as records management and archiving;.

3 UEA's Future IT Requirements

In this section we set-out the University's ambitions, both in relation to IT and the services it delivers which are supported by IT.

3.1 Introduction

We have considered information from the following sources in relation to the University's future IT requirements:

- The University's draft corporate plan and ISD's response;
- External drivers such as a demanding regulatory environment;
- Support for mobility, agility and flexible working; and
- Industry wide technology changes which have taken place since the last fundamental design (in 2002) of the University's infrastructure.

3.2 The corporate plan and ISD's response

The University's corporate plan sets-out its ambitions for the future. We have evaluated the key overall aims and set-out in the table below how IT can assist with their achievement.

Corporate aim	How IT can assist	Current position
Improving the student experience	<p>Providing first-class support services for teaching and learning and the delivery of the virtual teaching and learning facilities to mobile devices</p> <p>An accurate and attractive internet presence to attract applicants</p> <p>A modern, wireless IT infrastructure that is available to students</p> <p>24/7 IT support to mirror the availability of library facilities</p> <p>The ability to monitor academic performance and achievement such a self-service student dashboard</p>	<p>Good basic technology in teaching spaces but gaps in such areas as lecture capture and the spreading of best practice</p> <p>The internet site is being re-developed but the students we consulted thought it was fit-for-purpose</p> <p>There is an on-campus wireless network but only a wired infrastructure is available in University accommodation and this limits mobility. The current campus wireless facility is regarded highly by students</p> <p>IT support is based on traditional office hours</p> <p>There are no facilities yet provided to students to support this but electronic coursework submission is supported and this is the first stage in the lifecycle of such a facility</p>

Improving the employability of the University's graduates	<p>Competence in using industry standard packages such as Microsoft Office</p> <p>Providing IT students with the opportunity to work at the University</p>	<p>Access to industry standard packages is provided on University computers</p> <p>This is under active consideration by ISD</p>
Supporting the career development of academic and support staff	<p>Provision of a HR application which supports career development, training and certification and can identify where gaps in qualifications and training exist and need to be addressed</p>	<p>This functionality has not been enabled in the current HR system, however this is a business decision rather than one resulting from a decision by ISD</p>
Supporting high quality research	<p>Provision of an IT infrastructure and services attractive to researchers</p> <p>Provision of collaboration tools which be used globally</p> <p>24/7 support to support the research community's IT needs</p>	<p>Researchers were generally dissatisfied with IT facilities and services but did recognise that HPC provision was positive</p> <p>Very limited access to such tools and not provided as "Supported" applications by ISD</p> <p>IT support is based on traditional office hours</p>
Supporting enterprise and innovation	<p>Provision of an IT service oriented architecture which allows for rapid changes to be accommodated to integrate new applications and allows components to be re-used thus supporting rapid innovation</p> <p>Monitoring external funding opportunities</p>	<p>The current IT architecture is not service oriented and there are opportunities for this to be integrated initially into the University's IT infrastructure to support the introduction of a services oriented approach to IT architecture</p> <p>ISD monitors funding opportunities from JISC and applies where they align with current work opportunities</p>
Supporting engagement and advancements	<p>Provision of IT to support public and community engagement e.g. through the internet presence</p>	<p>This is a business decision which could be included in the refreshed website design</p>

<p>Remaining financially sustainable</p>	<p>Provision of accurate and timely management information</p>	<p>Examination of the current finance system and business processes surrounding financial management suggest that there are major issues relating to monitoring such data accurately and that the new corporate plan imposes KPIs which will be very difficult to monitor (we were informed that the number of currently un-monitorable KPIs is two-thirds of the total).</p>
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ISD has issued its response to the corporate plan which sets-out the IT priorities for change. These include:

- A more facilitative approach to IT provision to become more of an “Enabler” and to allow the user community to make decisions based on an assessment of risk;
- Storage, the requirement for which is growing and needs to consider options other than in-house provision;
- Authentication and identity management to meet security requirements;
- Support for research including compliance with research councils' requirements and collaboration;
- Enhancing value through the adoption of virtualisation technologies;
- Smart outsourcing of facilities such as office suites and filestore;
- The provision of high performance computing to support the research agenda;
- Improvement of teaching spaces through encouraging student use of personal IT and desktop virtualisation;
- Supporting teaching through better on-line facilities and teaching aids;
- Enhancing electronic assessment of student work;
- Providing better support for mobile and remote access;
- Providing better IT support and better aligning the helpdesk with the University's requirements;
- Engaging with the University's alumni through CRM and an enhanced internet presence;
- Delivering enhanced management information to assist in the achievement of financial sustainability;
- Delivering new business systems to support such areas as attendance monitoring for students and research information management;
- Consolidating applications to simplify the applications portfolio;
- Enhancing the infrastructure to support the delivery of efficiencies in such areas as coursework management, collaboration and cashless systems for students;

- Improving records management so that the University can enforce retention policies and minimise the amount of live data it holds;
- Improving employability by seeking ways to provide students with opportunities to work in IT provision; and

Our view is that ISD has provided a solid response to supporting and enhancing the delivery of the corporate plan and that these suggestions should be taken formally through the University's IT governance processes.

3.3 The ability to generate information to support the corporate plan

The corporate plan contains significant numbers of key performance indicators (KPIs) in relation to each of the University's corporate aims. Our discussions with those responsible for the provision of corporate management information revealed that approximately two thirds of the KPIs cannot be monitored from the existing corporate management information system provided by the University's data warehouse.

3.4 External drivers

External drivers include:

- The University's plan to grow student numbers by 2,500 FTE at a time when the number of 18 year olds is decreasing is ambitious and will need carefully targeted marketing and an enhanced internet presence to support this ambition;
- Additionally there are societal pressures such as the expectation of greater personalisation and reward for loyalty that need to be considered;
- The demanding external regulatory environment which imposes standards relating to data security and information security; and
- Meeting the demand for increased mobile access to applications and information.

3.5 Support for mobility, agility and flexible working

Support for mobility, agility and flexible working is paramount to the future success of the University. Greater collaboration with global institutions means that academic staff and researchers will need to be able to access IT support services" on a 24/7/365 basis and the current IT support arrangements do not support this.

The improvement of support for mobile, agile and flexible working must be integrated into the next generation IT architecture.

3.6 IT industry technology changes since the last architecture refresh

In 2002 the University refreshed its technology architecture. Now, 10 years on from the last refresh, the University needs to consider how it can embrace technological changes to support its future strategy.

The major changes which have taken place in the IT industry are:

- The adoption of service oriented architectures (SOA) which put-in place a technology stack to permit rapid change and integration of new applications and the deployment of modern infrastructure management tools. Adoption of a SOA approach would support the rapid deployment of infrastructure, permit the integration of new applications and facilitate the sharing of data. A SOA approach means that services such as identification and authentication call on horizontal infrastructure components and that such functionality is not embedded within the application logic. A SOA approach could be adopted initially in the replacement of the University's current in-house developed identification and authentication facility (SPOT).
- The emergence of Cloud based computing services for the provision of applications (software as a service) and storage/processing (platform as a service). Many universities have taken advantage of these facilities from such suppliers and Google and Microsoft, which for example, provide the education sector with free office suites, email and storage. To use such services in ways that comply with the security standards of the user organisation it is necessary to ensure that identification and authentication is integrated into the overall architecture and this requires components of a SOA to be present, where identification and authentication are run as services rather than as discrete add-ons to applications.
- Virtualisation in relation to server provisioning, storage and desktops. The University has some experience of storage virtualisation, but its experience of server and desktop virtualisation is limited and has been constrained by the inability to generate staff savings because of relatively meagre staffing levels in data centre and infrastructure teams. However staff savings are only one component of the total cost of ownership surrounding virtualisation, with a much stronger business case being presented through the gaining of scale economies through more effective resource sharing, lower power requirements and reducing the support burden on desktop support staff (such as faculty IT support).

The University should now plan for its next major technology refresh, and in doing so will need to address the gaps in competencies in relation to architecture identified in section 3 of this report and it will also need to consider enhancing the skill levels of infrastructure deployment and support staff so that these new technologies can be implemented successfully.

The introduction of a new IT architecture into the University will be a major project and this will have a significant impact on:

- ISD staff skills requirements to build and maintain the infrastructure; and
- The ISD budget and University budget requirements over the next 5 years.

3.7 Key Opportunities for Improvement

This section summarises the key improvements we think can be made in relation to future IT service provision. These are:

- Building on the current best practices in delivering a high quality educational experience through the more uniform adoption of teaching and learning IT facilities;
- Enhancing the attractiveness to the University to prospective students by providing Wi-Fi in student accommodation;
- Consider mechanisms and sourcing options for providing enhanced student IT support such as laptop loans, rebuilds and virus/malware removal;
- Improving the HR system to implement functionality to record staff development and/or re-consider as part of an ERP project as an extension to the replacement of the current finance system;
- Developing the current management information system to enable the full portfolio of corporate KPIs set-out in the corporate plan to be monitored;
- Exploring the use of collaboration tools to support global working and research collaboration including the provision of cloud-based office systems, email and storage;
- When designing the next generation IT architecture base it on a service oriented model to facilitate rapid change and integration with partners and to support the ability to integrate externally provided services such as cloud based office systems into the University's security domain.

4 Key Actions

This section of the report sets-out the key actions and associated costs that will be required to implement the suggested strategy in relation to:

- Resolving issues with the current IT service delivery processes
- Embracing the changes needed to support the achievement of the University's key future aspirations.

Anticipated capital and revenue costs are provided where available.

4.1 Resolving issues with current IT service delivery

The University should consider the following recommendations:

- The next generation infrastructure should focus on greater data centre virtualisation and the replacement of PCs by virtualised desktops where appropriate and this will improve the efficiency of IT support staff (to replace 80% of the current desktop estate would incur capital costs in the region of £2m and we expect that server virtualisation would cost in the region of £1m but this investment should at last break-even in terms of total operating costs over a five year period);
- The University should, through its governance arrangement, revisit its resilience requirements and determine if it remains content with possessing the single points of failure in relation to infrastructure, elements of ISD staffing and the decision to not have off-site backup storage (depending on the outcome of any such review there could be significant cost implications);
- At a structural level IT governance is in place but it needs to focus "Beyond the business case" to ensure that anticipated benefits are realised (we expect this to be cost neutral);
- ISD should focus more attention on understanding demand through the creation of a user relations capability which listens, directs resources into required areas and manages delivery, and faculties and schools must be prepared to pay for their demands being satisfied (there may be staff costs associated with this function in the order of £100K PA for two posts);
- Expectations for the performance of ISD should be captured in a service level agreement and this should cover such areas as help desk performance, system availability and user satisfaction (we expect this to be cost neutral in terms of its development but if the University requires a higher level of performance than is currently available then there may be a significant cost associated with this);
- The IT help desk needs to be improved to improve user satisfaction, resolve problems within agreed deadlines and improve the overall perception of the IT service (we expect that the University will incur a cost of c£30K in relation to service desk process design);
- Security should be based on a risk assessment rather than the imposition of blanket controls (we expect that this will be cost neutral and become embedded into IT governance processes);
- The University should develop a strategy in relation to core university administration and student administration systems and business processes so that these can be consolidated and simplified (we expect that this will incur a

one-off cost of c£50K in relation to planning and business case development, but it should be cost neutral in relation to implementation providing that the business case is justified);

- Communication about IT and how it can help all communities should be spread based on best practice, but in many instances this will not be ISD led (e.g. Blackboard is L&T led).
- The University's policies in relation to DPA and FOI are not supported through automated tools and this will require investment in underlying software infrastructure such as records management and archiving (we expect that capital costs in the region of £200K would be required to buy a records management software and that annual maintenance charges of c£40K would be incurred) but there would be a significant costs associated with the deployment of the application and its integration into the University's applications and IT infrastructure which may be between £1m and £2m and a business case should be developed to support its implementation.

4.2 Resolving issues with future demands on the IT service

Our recommendations in relation to future demands on IT are:

- Building on the current best practices in delivering a high quality educational experience through the more uniform adoption of teaching and learning IT facilities (we anticipate that an additional four learning technologists posts will be required at an annual cost of £210K);
- Enhancing the attractiveness to the University to prospective students by providing Wi-Fi in student accommodation (in-house and outsourced options are currently being investigated and may incur a cost which will not be recoverable from student rental costs);
- Considering mechanisms and sourcing options for providing enhanced student IT support such as laptop loans, rebuilds and virus/malware removal (this should be cost neutral providing that a suitable supplier can be sourced)
- Improving the HR system to implement functionality to record staff development and/or re-consider as part of an ERP project as an extension to the replacement of the current finance system (switching-off the current HR application will save c£100K PA and providing this functionality in a replacement HR system were it procured as part of the finance system would be cost neutral at worst);
- Developing the current management information system to enable the full portfolio of corporate KPIs set-out in the corporate plan to be monitored (for ISD to provide a reporting tool such as Business Objects would cost in the region of £200K plus £40K PA maintenance and there could be significant build and deployment costs associated with this activity incurred at University level);
- Exploring the use of collaboration tools to support global working and research collaboration including the provision of cloud-based office systems, email and storage (for the HE sector external suppliers such as Microsoft and Google provide this free-of-charge but there would be build and transition costs which we would expect to be cost neutral over a five year period) additionally if the University wished to provide a "Private cloud" for research purposes this would cost in the region of £50K PA;

- When designing the next generation IT architecture base it on a service oriented model to facilitate rapid change and integration with partners and to support the ability to integrate externally provided services such as cloud based office systems into the University's security domain (to put-in place the basic components of a SOA platform such as JBoss would cost in the region of £200K as a capital investment plus c£40K as an annual maintenance charge) and there would be a cost associated with SPOT replacement which may be in the region of £50K capital and £10K PA maintenance).

4.3 Implementation plan

Our suggested implementation programme plan is provided below.

ISD led activity		University led activity			
2012	2013	2014	2015	2016	2017
IT risk analysis inc. resilience/SPoF review					
IT risk mitigation					
SOA and virtualisation planning	Data Centre – Server virtualisation				
	Data Centre – Desktop virtualisation				
	Cloud exploitation e.g. office/email				
	Infrastructure integration e.g. SPOT replacement				
Governance review	IT structure review	Demand-led service provision approach			
Service desk review	SLA design and implementation				
Corp plan gap analysis	Corp plan MIS build				
FOI & DPA business case	FOI & DPA automation				
Best practice identification and deployment in University services e.g. L&T					
Student WiFi					
Core applications review	Core applications consolidation				