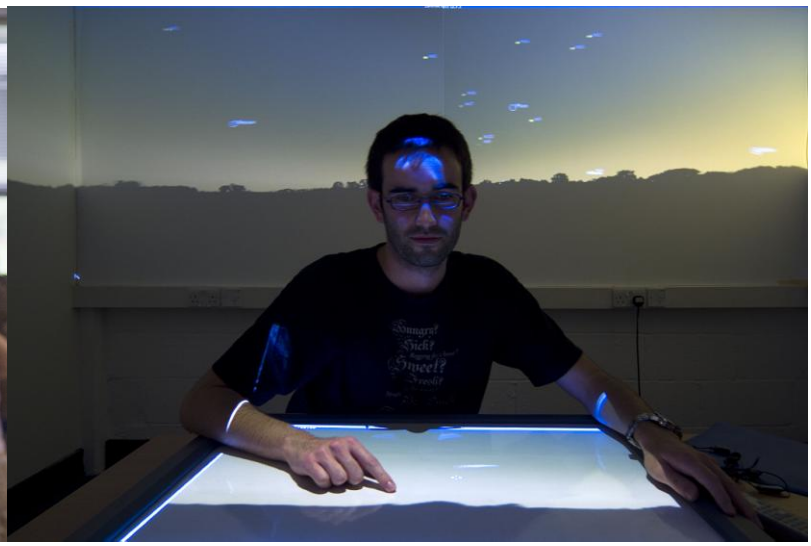
UCD IT Services

# UCD IT Strategy 2009-13

*December 2008*

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## Executive Summary

UCD's IT Strategy 2009-2013 is developed in the context of both the Education and Research strategies of the University and will deliver the technology, systems and information management infrastructure to support the goals of these strategies. The primary driver of the IT Strategy is our user community of staff and students, together with the rapidly growing number of collaborators and associates across the HE sector and in the wider economy. The context for the IT Strategy is to ensure our IT infrastructure and services meet and exceed the standards required to deliver the Education and Research objectives of the University.

## User Community

In developing the IT Strategy the characteristics and demands of our user community were established through a combination of surveys, interviews and group sessions. Benchmarks against other equivalent Universities were also used to determine our position in a global context.

The key characteristics of our users can be summarized as "**Highly Mobile**", demonstrated by 80+% laptop ownership with a preference for wireless networks, "**Strong bias for electronic information**", with over 70% regular use of on-line web and library resources. The University also has a **very high adoption rate** for its portal (UCD Connect) and eLearning environment (Blackboard), with consistently 16,000 users on a daily basis.

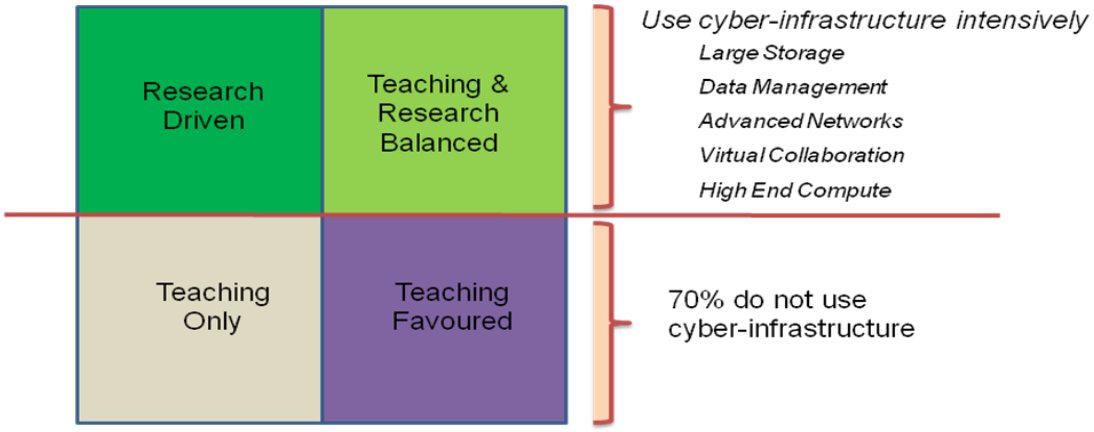
## University Objectives

Our key IT technologies and infrastructure are driven by the University goals and its positioning in the HE sector. Based on US studies the implementation of IT alters substantially according to the mission of the University, particularly in the development and use of "Cyber-Infrastructure" as defined by NSF.

> *" The organized aggregate of information technologies that can be co-ordinated to address problems in science and society."*

These "cyber-infrastructure" technologies include Large Storage Capacity, Data Management, Advanced Networks, Virtual Collaboration and High End Compute capacity.

A mapping by University mission indicates that the development of these technologies is essential to institutes with research intensive or balanced research / education strategies.



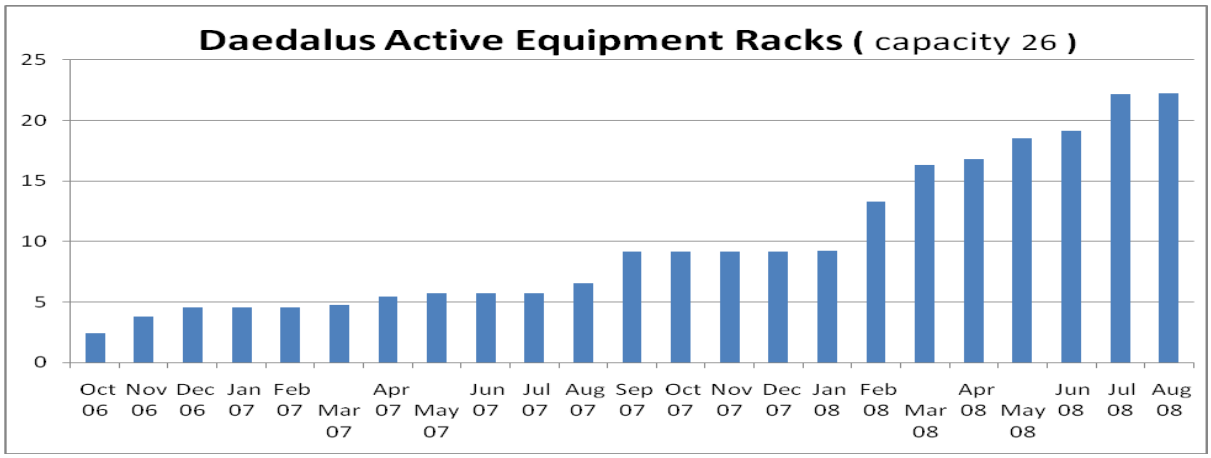
## Current UCD Position

The current IT infrastructure and services have developed over the last 5 years from a relatively low base to a substantial environment with a high level of adoption and a comprehensive range of services.

Key strengths of the current environment are:

- Modern high performance network with all buildings cabled to modern standard and connected to national and international fibre backbone through UCD and HEAnet.
- Key systems implemented on redundant architecture meeting 99.5% target availability levels – UCD Connect, Blackboard, eMail, Business Systems.
- Advanced Research IT provision including hosted data centre services, compute clusters, and storage. National ICHEC cluster to be hosted in UCD Daedalus Centre from Jan 2009.
- Growing adoption of Teaching & Learning technologies with pilot implementations of lecture capture and classroom technology.
- Extensive use of portal and eLearning services on a 24 x 7 basis with very high adoption rate by UCD staff and students.

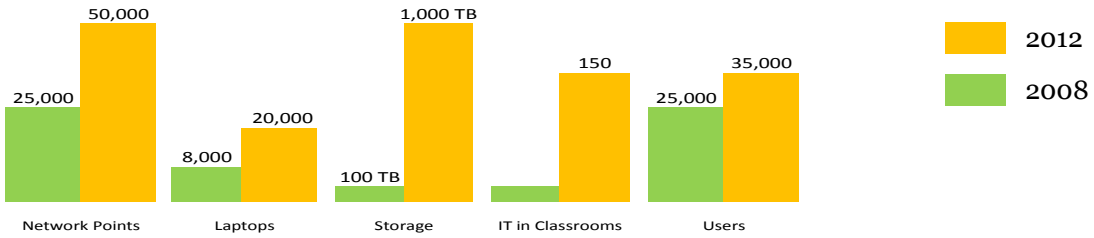
The improvements over the past 5 years were achieved through the investment of capital funding in the IT Architecture, on average EU 3mil per year. The growth of services is evident both in the expansion of the network – from a baseline of 5,000 network points in 2000 to the current level of 24,000 network points in 2008. Perhaps more significantly, with the implementation of the Daedalus Data Centre in 2006 the growth in use of "cyber" technologies has expanded rapidly.




The "equipment racks" in Daedalus represent the deployment of data storage and compute clusters to meet the demands of both Research and Education. Over a period of 2 years the centre has reached 90% capacity and the ICHEC installation will add a further 16 racks of expanded space.

## Key Development Priorities

Projecting requirements over the next five years the UCD campus continues to expand at a rapid pace with an expected growth based on the development plan to double the current network size i.e., 50,000 network points by 2012. In parallel, the key growth area for users is in storage requirement and the need for effective data and information management. The developments in both Education and Research will drive the scale of electronic information to levels well beyond current capacity; a conservative estimate for 2012 is 1,000TB of data storage.




We currently have a laptop population in excess of 80% of users and consistently see over 8,000 simultaneous wireless connections on the network. The intensity of use is growing and a minimum estimate of 20,000 simultaneous connections is anticipated by 2012. The recent classroom technology implementations have been very successful and more widespread deployment is a top priority for users.

*To meet the demands for increased capacity and to deliver the technology appropriate to the University mission and strategy, the following key IT priorities have been identified:*

### 1. Sustaining the IT infrastructure and IT performance

The implementation of the IT Architecture plan over the last five years has made a substantial difference to the quality and scope of IT infrastructure and services. Maintaining the performance and capability of this environment requires investment in the refresh of technology and networks. This is an essential first step in order to build on the progress made to date.

### 2. Enhancing the user experience and access to information

The major new systems areas have been addressed by implementations over the past five years, however the web interface and experience for users does not meet expectations. The focus will therefore be on improving web access to systems and enhancing the availability of information for users. This priority spans all areas including business systems, mobile and portal services, and UCD web.

### 3. Building a collaborative Data Centre

The capacity requirements for the University have already outstripped the current data centre provision. IT Services have developed a business plan for a collaborative UCD and national data centre to be developed on the Belfield campus. This is an essential component of the IT infrastructure.

### 4. Implementing classroom technology and learning spaces

The current UCD infrastructure has a significant deficit in classroom technology which is now being addressed. The continued implementation is a priority for UCD staff and student users.

### 5. Growing eContent and data management capability

Managing electronic content and data resources will be a key capability as the scale of information capture expands. Developing these skills and services will be a primary goal of the IT strategy.

# 1. Introduction & Background

UCD IT Strategy is developed in the context of the overall Strategy for the University and is designed to support the goals and objectives of the UCD community. As our current IT Strategy (2002-2007) was reaching completion, IT Services in 2007 commenced the process of developing the next IT Strategy and aligning this exercise with the overall planning of the University. With the rapid rate of growth in the UCD campus and the expansion in activities, it is particularly important that we plan in advance for both IT infrastructure and services.

The time horizon 2009 – 2013 was selected as a reasonable period both to predict IT requirements and to plan for the necessary services. During that period we foresee substantial growth of physical infrastructure and also significant change in the diversity of demands on IT Services. The IT Strategy project was designed to gather accurate information on the capacity and scope of services required by our user community and to anticipate the changes in IT on a global level which impact on our delivery and service mix. A more detailed description of the consultation process is included in Appendix A.

## Current IT Plan

Our EICT Strategy 2003-07 and related IT Architecture Plan set out key projects to be achieved over a five year period. Both these plans have now reached completion, and an assessment of progress shows significant developments in new services, together with a large scale expansion in IT infrastructure.

*The high priority objectives set out in the 2003-07 plan are shown in the table with current status:*

| **IT Strategy Objectives (03-07)** | **Current Status / Progress** | **Issues / Comments** |
|---|---|---|
| Implement eLearning electronic environment and promote its use for courses. | Blackboard eLearning environment implemented and widely adopted. 20,000 users, 85% student use | Further work required on more complex eContent projects. |
| Provide in-class ICT facilities with appropriate support and training for academic staff. | Very limited progress over the period of the plan. Pilot project implemented in 2007 to address the support model. Proposal for Summer 2008 for Newman Theatres. | SMT project currently addressing the long term refurbishment issues. *"Teaching & Learning Enhancement Project"* |
| Support and develop services which would facilitate research projects & groups. | New Research IT support team in place with new services for research groups – vs. training, hosting, storage, & compute capacity. | New research data centre implemented in 2006 in the Daedalus Building. |
| Provide quality network bandwidth both local & international. Provide high quality network access for users. | Refurbishment & replacement of all old network infrastructures on campus complete. External bandwidth and dual fibre connectivity installed. | 10 GB national & international bandwidth implemented with HEAnet |
| Reduce the overall administrative burden by streamlining the | Major developments in student applications, on-line registration and | Further work needed on staff interface, e.g. exam marks, |

| | | |
|---|---|---|
| recording & processing of data. | enrolment. | curriculum descriptor. |
| **IT Strategy Objectives (03-07)** | **Current Status / Progress** | **Issues / Comments** |
| Review business processes, incorporating technology where appropriate. | Web based interfaces for Finance & HR systems (eProcurement, eRecruitment). Implementation of Business Objects reporting environment. Initial stage Research Management implemented. | Further work on web enabling systems required. Phased development of Research Management planned. |
| Enable access to a quality PC for all staff and students. | Development of SUAS facilities widening access. Implementation of laptop programme, laptop loan & laptop areas. | Current laptop ownership by students is over 80%. PC ownership is 98+%. |
| Provide anytime / anywhere access for all users. | UCD Connect portal implemented to provide web access to IT Services and applications – widespread adoption with 24,000 regular users in 2008. | Extensive wireless access installed on campus – 700 base stations. Further mobile broadband planned. |
| Provide a comprehensive base of electronic information resources. | Significant development in electronic materials available through Blackboard. Substantial use by students of on-line library resources. Expanded access to information resources through UCD Connect, particularly off-campus | Web content management system currently being introduced to facilitate creation & management of UCD Web Sites. |
| Provide simpler and coherent access to support services. | Single phone support (help desk) and 4 x local IT Centres implemented. Distributed support model with call out service introduced. | Work on web support site and knowledge base currently underway. |
| Implement flexible IT technical architecture to facilitate expansion improve performance & provide contingency. | IT Technical Architecture Plan developed and implemented. Service level targets of 99.5% availability now met consistently. | Network availability now reaching 99.9%, exceeding target level. |

## Summary Status

The main progress achieved under the current plan was in development of the IT infrastructure and the provision of on and off-campus access to a wider range of electronic services. A fully up to date network is now in place together with high availability platform for systems and services. Major new environments implemented in the course of the plan include **Blackboard**, **UCD Connect** and **Web based Student System interfaces**. The major objectives from the current strategy where substantial further work is required are *Classroom Technology, Electronic Content Development, and Web Enabling of Business Systems.*

## User Community

When our first IT Strategy reviewed the customer base and the type of services used by each customer group, the focus was on UCD Staff and UCD Students. In the new environment, we see both an expansion of users within the student category and the growth of new categories of users, driven by collaboration and multi-institutional initiatives. We also now sub-divide the user categories, providing more focused and targeted services, for example dedicated services for Teaching & Learning and Research users. The table below illustrates the changes to our user population.

| | | |
|---|---|---|
| **UCD Academic and Administrative Staff** | Teaching & Learning IT Users<br>Research IT Users<br>Administrative IT Users<br>Part-time and adjunct staff<br>UCD occasional users e.g. retirees | Existing group with some expansion of service to retirees. |
| **UCD Students** | Undergraduate<br>Post-Graduate (Taught & Research)<br>Prospective Students<br>Alumni | Expanding group with new users in Prospective & Alumni categories |
| **Associate IT Users** | Affiliates & Collaborators<br>Visiting Users<br>External Users<br>Campus Users (e.g. residents) | Growing group of new users which has yet to be clearly defined. ( e.g. associate staff in hospitals ) |
| **Consortia** | Multi-institutional HE groups | New Users ( e.g. HE owned research consortia ) |

## UCD & IT Context

The IT Strategy is developed in the context of major strategic and organizational changes in UCD, specifically:

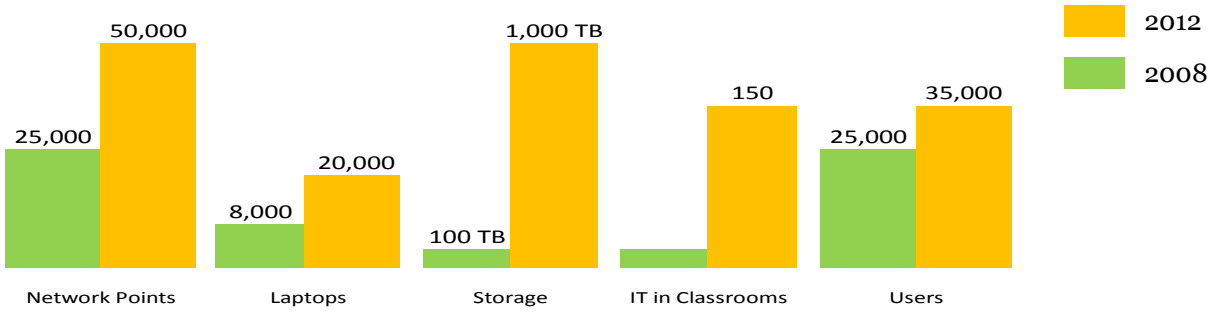
- Growth in research activity and increased demand for new and advanced services for research users.
- Modularisation and semesterisation with consequent demands for IT enabled processes for users.
- Development of graduate schools with emerging new customer base of graduate students.
- Campus development encompassing new activities and expansion of existing activities e.g. residences, retail, commercial, research, conference etc.
- UCD Education Strategy and UCD Research Strategy.

There have been substantial changes in the external IT context including the emergence of significant new commercial IT offerings - web services, storage & compute services from providers such as Google and Amazon. The development of national compute resources and infrastructure ( e.g., ICHEC ) adds a new dimension to potential services, while the massive increase in availability of electronic resources and electronic publications places even greater demands on storage and access.

# 2. IT Requirements

A series of information gathering exercises including surveys, interviews and workshops were used to gather UCD IT requirements across our user community. A summary of the priorities identified in each area and the major gaps in IT Services were identified. A number of site visits to other Universities and Institutes were also used to build a profile of future demand and to identify best practice.

Projections of growth in the Campus and the consequences for IT were also compiled. The graph below shows the predicted expansion of IT requirements – Networks, PCs, Storage, AV, and Users, over a four year period (2008-12).




## Issues & Priorities

The major issues and priorities identified in the consultation process and through our IT Groups were:

### Teaching & Learning

A survey of Academic Staff conducted in 2007 was designed to determine the IT requirements for Teaching & Learning. The five most highly ranked needs were:

(1) Audio Visual Technology (Standard and/or Plug & Play)

(2) Software Applications for home use

(3) New software applications

(4) eLearning development, training & support

(5) Assessment tools

The ECAR standardized survey on "Student Use of Technology" was completed by 1,193 UCD Students in April 2007. The outcome was compared with a US baseline of 27,846 student responses.

*Some of the key findings from the survey were:*

- UCD students have over 80% laptop ownership, with 98% PC ownership ( 35% own both )
- UCD students have a high demand for electronic resources 82% access the eLearning environment and 69% access electronic library resources at least once a week. ( significantly higher than US average )
- The use of Internet searches for learning and communication predominates ( 80% + )
- Wireless access is now the norm on campus ( over 30% cite as the preferred mode of access )
- UCD students bring their laptops to class ( 30% ), substantially higher than the US average

The pattern of findings from the survey confirms recent experience with student use of technology on the campus – a preference for stand up PC facilities, use of wireless and communal spaces with typically 10,000 wireless devices on campus at peak term times in November.

## Research

Through the Research IT Steering group a survey was designed to capture the IT requirements of research users within UCD. The survey was circulated to research academic staff in 2007. Following the review of responses a number of focus groups and interviews were organised with key users. The six most highly ranked needs identified by the research community were:

(1) Research IT support services, specifically - consultancy, support, security and training

(2) Research applications, programming tools and database provisioning tools

(3) High bandwidth network connectivity

(4) Mass research data storage ( & related data management services )

(5) Research collaboration services e.g. software tools, collaboration space and video conferencing

(6) Research compute clusters and equipment hosting service

A number of site visits were also conducted to other Universities and research institutes to assess their top requirements from their research communities. Site visits included Janelia Farm, Systems Biology (Seattle), Virginia Tech, Edinburgh.

*These were the key outcomes from these visits:*

- The benefits of a large cluster for use by the University research community (Virginia Tech).
- A need to investigate how best to design and develop interfaces for scientific equipment so as to connect them to backend technologies and be able to visualise the data (Janelia Farm).
- A model for developing flexibile research data storing and management options is required (Systems Biology, Seattle).
- Models for operating large data centre, and shared compute services for research (Edinburgh).

## Administrative Systems

The approach to the development of the strategy for administrative systems focused on gathering requirements across the broad spectrum of users identified, and in engaging in consultation to review and confirm these needs. **Five clear themes** in the area of Administrative IT emerge from surveys and consultations conducted as part of this strategy exercise, these are:

(1) UCD Staff want to tap into the wealth of information which is stored within our key business systems to help them meet their responsibilities. Specifically, in this area staff would like more information relevant to their role available easily over the web. They require better historical information so that they can examine trends and directions. They require more intuitive and graphical information – particularly at senior levels.

(2) UCD Staff want administrative processes which are online and as simple as possible – drawing from their personal experience of, e.g. purchasing books or airline tickets online. This will require significant investment to provide web-based processes which join up discrete back-end systems in areas such as student, research, financial or HR management.

(3) Making the most out of our basic office productivity tools is a key priority of UCD staff. This includes more widespread usage of online calendaring, more effective document management and easier collaboration on projects.

(4) UCD Staff want information and processes to be integrated so that they are not being repeatedly asked to do the same things or provide the same information over again. They want us to ensure that our systems are implemented within an overall information architecture context and that investment is put into ensuring a high level of integration between them.

(5) UCD Students like the flexibility which online provision of services allow. They want far more of the administrative services to be provided to them in this way – integrated with some of the online academic services that they require.

## Web Services

Specific surveys of staff and students in relation to the entirety of the website have not yet been deployed. However a number of initiatives in individual areas such as Research, the Student Technology survey and other Web projects do give an overview of the current position.

(1) The web site is extensively used by students for information – both the main web site, the library site and UCD Connect.

(2) The extent of use of UCD Connect has grown rapidly in the last 4 years and it is now the primary entry point for students and staff with 24,000 unique users per week.

(3) Staff in particular report the existing Search facility as very poor and in general it is difficult to find information on the UCD web site.

(4) Colleges, Schools and the organization overall report difficulty deploying resources to maintain and update their web sites. This is a persistent, recurring problem.

The Web and Portal IT Steering Group has reviewed the current UCD Web environment in conjunction with UCD IT Services and has assessed the options for improvement and future development. The following issues in relation to the current environment have been identified:

- The current UCD web site is large, distributed and encompasses over 250,000 pages of material. The web site includes not just the primary UCD domain but a large number of related domains which maintain substantive UCD information.
- The existing search facilities are widely considered to be unsatisfactory and in need of urgent improvement.
- The main elements of the navigation and branding have been successfully standardised and are widely adopted. A review of existing web sites and their effectiveness was commissioned by UCD Communications Office in 2008 and will inform on-going design standards.
- It is difficult to manage content on the current site as most information resides in individual pages and requires web skills to maintain and update.
- The current web site is used for both external and internal information – contributing to its size and in some instances creating problems with access management.

## IT Infrastructure

While the major infrastructure issues have been addressed in the current plan, the growth in UCD continues to place massive demands on the development of the IT infrastructure. The Campus Development plan has been used to determine network requirements over the coming years. The growth pattern in research and electronic materials has been used to predict storage and data centre requirements. The major infrastructure developments required are:

(1) Creation of a new Data Centre ( circa 400 sqm ) to replace the older Computer Centre and to provide the necessary expansion capacity to meet user demand.

(2) Expansion of the Network infrastructure to meet new campus developments – vs. a growth from 25,000 network points to 50,000 network points.

(3) The expansion of storage capacity from current 200TB to 1,000TB and potentially 2,000TB.

(4) The installation of classroom technology facilities ( covered under a related SMT project ).

## IT Planning

The issues identified in each area, together with initial consultation with the Education Strategy and Research Strategy projects have been used to determine a series of proposed IT projects and objectives for the IT Strategy (2009-13). These projects are summarised in the next section and will form the basis of more detailed IT implementation plans linked to UCD's Education and Research Strategies. Further consultation will also be carried out with related support and information services ( Library etc. ). The detailed planning process is described in Appendix A.

# 3. Summary IT Plan & Objectives

To address the issues identified and to develop IT Services which will meet the goals and objectives of UCD, the following key IT areas have been identified for development in the next 5 years.

## Infrastructure

The previous history and recent improvements have shown that a high quality core IT infrastructure is essential to the operation of the University and underpins all other development. The IT Plan must therefore address all of the outstanding infrastructure deficits and meet UCD's expansion requirements.

**Core Infrastructure projects:**

3.1 Implementation of ICT Classroom Technology (*SMT Teaching & Learning Enhancement Project*)

3.2 Design and implementation of new data centre capacity ( Full design brief in preparation. )

3.3 Implementation of data storage expansion capacity

3.4 Design and expansion of the UCD campus network

## Teaching and Learning IT

Based on the priorities identified and the future development of the eLearning, physical and virtual environment the following priority projects are proposed:

**Teaching & Learning IT projects:**

3.5 Implementation of support model for ICT in Classrooms in collaboration with Building Services

3.6 Implementation of "e-content" development support service to promote eLearning

3.7 Expand mobile services to cater for the new student profile – laptop, eContent & mobile software

3.8 Work to expand new learning & social spaces which are fully technology enabled

## Research IT

The most fundamental requirement of UCD researchers and their collaborators is for basic infrastructure to meet the demands of their projects. In establishing a Research IT support team UCD IT Services has successfully demonstrated the benefits of a coordinated approach to IT for research. The priority projects will expand infrastructure and build on this service:

**Research IT projects:**

3.9 Expanded hosting and storage capacity for research in the new data centre.

3.10 Continuous upgrade of network capacity in conjunction with HEAnet

3.11 Provision of data management service to address the full data life cycle

3.12 In conjunction with ICHEC, provision of high performance compute resources

3.13 Further develop training and support services for research users, including applications

## Administrative IT

The focus of requirements in the administrative systems area is to address the ease of use of systems and access to key information. This will involve web enabling of key business system elements, the development of management information services and underlying systems integration.

**Administrative IT projects:**

3.14 Provide web based user driven services for key processes ( e.g. curriculum builder )

3.15 Address the need for management information and reports

3.16 Provide staff with comprehensive office productivity tools

3.17 Develop a prioritized information systems plan in conjunction with users

3.18 Ensure integration of information across systems

## Web Services

The immediate requirement in the web area is to improve facilities to manage content and search UCD web site. The development of portal and new web technologies will build on the success of existing services. Particularly expanding capacity, providing new services and implementing single sign-on.

**Web & Portal IT projects:**

3.19 Ensure UCD web is easy to manage and improve search facilities

3.20 Develop portal services to meet the mobile and access needs of staff and students

3.21 Implement single sign-on, improve UCD Connect interface & improve performance

3.22 Develop a web architecture and provide more advanced Web 2.0 technologies

# Appendix A Project Approach and Consultation Process

The development of UCD IT Strategy has been informed by internal and external review of requirements over a period of 12 months commencing in March 2007. The planning cycle has been complemented by an extensive consultation process and interaction with UCD strategic planning.

The approach adopted was as follows:

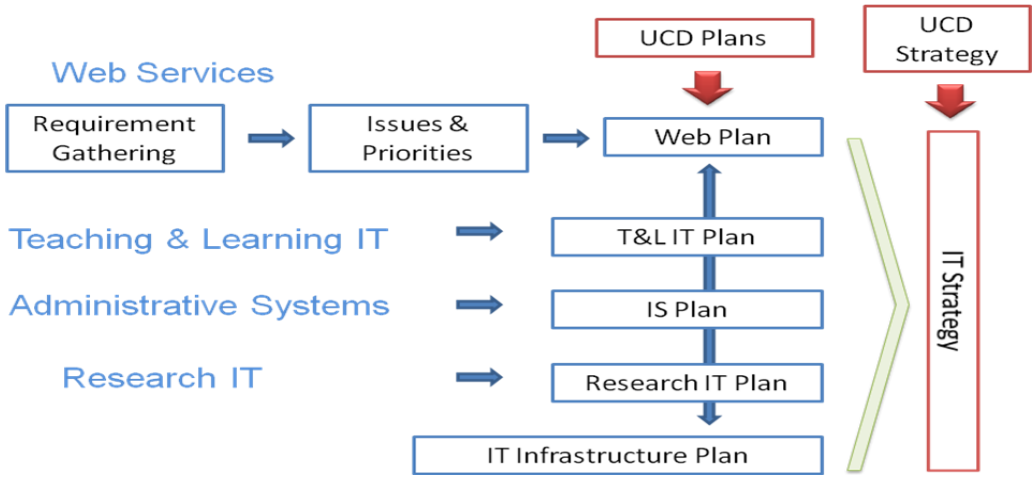
## Development of Requirements

The IT Planning was conducted in four major strands in conjunction with our IT Steering Groups:

- Teaching & Learning IT
- Research IT
- Administrative Systems
- Web Services

For each area surveys and focus groups were conducted, followed by discussion and review of the issues and priorities by each steering group. Draft plans and priorities for each area were then prepared.

The next stage consisted of evaluation of these plans in the broader UCD context – e.g. relative to UCD Education Strategy and UCD Research Strategy. Further consultation process was driven by the SMT IT Strategy project and reviewed by Senior Management Team Academic on 24th Oct. 2008.




The diagram above illustrates the planning cycle with detail shown for Web Services. The same model was applied for each of the four strands, followed by an integrative phase to develop an overall IT Strategy which would be internally consistent and meet UCD's strategic objectives.

To complete the strategy a **Customer Service Plan** and **IT Architecture** were developed which focus on the process for implementation and the underlying technical infrastructure which is required to support the strategy.

## Internal and External Consultation Process

Extensive consultation was carried out both internally (UCD) and externally to assess the potential of IT and to match this with UCD requirements. The stages adopted in the consultation were as follows:

(1) Review the external technology environment through visits to major vendors and consultation with other Institutions on their approach to IT. Use expert advisory services such as Educause, ECAR, Concourse and Gartner to anticipate future developments in IT.

(2) Conduct site visits to Universities and independent research centres both in the US and Europe who have advanced IT Services which can serve as a model for UCD. Visits and consultation were conducted with Northeastern, North Western, Indiana State, Warwick, Leeds, Janelia Farm…

(3) Consult with UCD IT Steering Groups and carry out in-house surveys and interviews to determine requirements of Users, Colleges, Schools and Institutes. Our four IT Steering Groups contributed substantial effort and time to the development of the IT Strategy.

(4) Survey students and staff on requirements:

- ECAR / Educause survey of student use of technology
- UCD survey of Academic Staff on Teaching & Learning IT requirements
- UCD survey of Research Staff on Research IT requirements
- Survey and interviews with Staff on Administrative IT requirements

(5) Review with Senior Management Team on major findings from the information gathering stage and ensure alignment with UCD Strategy development and priorities.

(6) Develop Draft IT Strategy consultation document.

(7) Review with internal UCD representatives on the Draft Strategy (IT Strategy Project Advisory Group). Circulate draft strategy to Colleges & Schools inviting comment.

(8) Consult with related projects – Education Strategy, Research Strategy.

(9) Review with external experts on the Draft Strategy.

(10) Agree and finalise UCD IT Strategy and implementation plan.

## Appendix B – Detailed IT Plans

1. Customer Service Plan
2. Teaching & Learning IT Plan
3. Research IT Plan
4. Administrative Systems Plan
5. Web Services Plan
6. IT Architecture

# Customer Service Plan

The objective for Customer Services over the coming three years is to maintain the high level of service delivered to the current & evolving UCD user community, as well as developing a Customer Relationship Management model which is

- Consistent
- Of a high quality
- Continuously improving

Currently customer services focuses on the delivery and support of a specific product or service, while moving to a relationship management model will seek to understand how customers actually use those products and services. Relationship management will inform customer service strategies. It can also improve how customers experience IT through:

- Increased customer advocacy
- Communication
- Measurement of customer satisfaction

A well executed relationship management strategy ensures that the entire IT organisation is properly aligned around customer requirements and business processes.

Relationship management & Customer Services strategy will encompass the following programme of work

(1) Development & implementation of a Customer Relationship Management Model

(2) Review of all existing support services

(3) Measurement of services – performance monitoring and customer satisfaction

(4) Support of new services and customer awareness programmes

## 1. Development & Implementation of a Customer Relationship Management Model

The aim is to develop a relationship model whereby we engage our customers beyond the "break and fix" type service to understanding how customers become aware of our services, how they interact with them and cultivate their feedback so their comments are fed directly into service development projects which aim to improve the customer experience.

Projects

1.1 Review Customer Liaison structure

1.2 Introduce "Relationship Managers" at school level

1.3 "One to One Visits" (Project Phase 1 – Heads of School/Institutes/Units)

1.4 "One to One Visits" (Project Phase 2 – All Staff)

## 2. Review of all existing support services

This programme aims to review all existing support structures – Helpdesk, IT Centres, Desk Side visits etc. – to ensure we are providing excellent and up to date customer services. It will also require us to look at open access student PC labs and their future in light of the ever increasing laptops on campus.

Projects

2.1 Review IT Services Helpdesk

2.2 Review Distributed Support Service – IT Centres & Desk Side support

2.3 Attain Certification – ISO900/ITIL

2.4 Review of OPAC labs and SUAS services

## 3. Measurement of services – performance monitoring & customer satisfaction

The focus in this area is intended to measure and monitor our services. Through a number of key projects we will identify all customer requirements, how we respond to requests, and ensure that once delivered we are tracking services to ensure they are working to an optimum level

3.1 Review current requirements gathering processes – all services & all processes

3.2 Introduction of new "Requests Process"

3.3 Measuring Customer Satisfaction

3.4 Review & publication of Service Level Agreements

3.5 IT Performance Measurement Enhancements Project

3.6 Student Sponsorship Project

## 4. Support for new Services and Customer Awareness Programmes

IT Services over the past three years have implemented a set of new services that are rich in functionality. One of the challenges for this plan is to support these new services and ensure customers are aware of and make the best use of these new services. A key component of this plan is to ensure all staff are aware of these new services and that they are informed of the best practice when using them.

4.1 Support Service Capacity Planning

4.2 Service Awareness Programmes

# Teaching & Learning IT Plan

A number of areas within UCD have benefited from the deployment of a range of teaching and learning "back-end" systems over the past 10 years. Furthermore, over the past three years, the implementation of the Blackboard eLearning environment has been widely adopted with over 20,000 users, 4,000 courses and 85% student use.

The key focus for this three year plan is to leverage these developments and focus on developing and implementing services to support the areas of *Classroom Technology, Electronic Content Development & Delivery, and expand Mobile Services*.

The IT strategy for UCD outlines five new objectives to build upon this foundation. These are:

3.1 Implementation of ICT Classroom Technology (SMT Teaching & Learning Enhancement Project)

3.5 Implementation of support model for ICT in Classrooms in collaboration with Building Services

3.6 Implementation of "e-content" development support service to promote eLearning

3.7 Expand mobile services to cater for the new student profile – laptop, eContent & mobile software

3.8 Work to expand new learning & social spaces, which are fully technology enabled

The following five programmes of work are proposed to meet these objectives and bring Teaching and Learning IT services in UCD to the next stage of development. They focus more strongly on enhancing services to our many user communities. The five priority programmes are:

(1) Standardised ICT classroom technology and a support model

(2) Technology enabled learning and social spaces

(3) Expand mobile services

(4) Lecture Capture

(5) eLearning Design & Development Service

## 1. Standardised ICT Classroom Technology and Support Model

Technology is an enabler of learning when instructors use it effectively. Therefore, it is important to ensure that there are no problems with the technology itself, that the instructors are trained on how to use it and that they receive responsive support in the event there may be problems. The current standard of AV equipment in the teaching spaces is non-standard, antiquated, and hard to use with a poor level of support and response.

Strategic Objectives

- Ensure there is a standard set of AV equipment available in all bookable teaching spaces.
- Ensure the equipment has a high level of availability, reliability and performance.

- Provide a one stop shop support service with guaranteed levels of response and recovery.

Expected Benefits

- To ensure a reliable, easy to use and supported AV service is in place, would remove this barrier to learning for the student.
- It complements existing work on the standardisation of ICT technology in the Newman Theatres.

## 2. Technology Enabled Learning and Social Spaces

Over 80% of students in UCD now own a laptop and wireless access on campus is now the norm. This has led to a demand from students for communal laptop friendly/social learning spaces and casual laptop access areas.

Strategic Objectives

- Ensure there is laptop friendly/social learning spaces and casual laptop access areas in all major buildings.

Expected Benefits

- These spaces will encourage student engagement in collaborative learning and increase the effectiveness of the physical learning environment.

## 3. Expand Mobile Services

UCD's students have over 80% laptop ownership and the demand for electronic resources is very high hence the need to make all our services and resources available to mobile devices both on and off campus. 60% of academic staff ranked having access to software applications off campus as important. In support of both these requirements, Teaching & Learning IT Services want to make software applications available both on and off campus to mobile and home devices for both staff and students.

Strategic Objectives

- Provide a software delivery system which can deliver software applications to staff and student client devices both on and off campus through a web interface via single sign on from UCD Connect.
- The system should be capable of delivering software to Windows, MAC and Linux clients in a reliable and performent manner.

Expected Benefits

- This will allow both staff and students the option to work on software assignments from any location and using their own client device.

## 4. Lecture Capture

According to the ECAR student technology survey, all students indicated convenience as one of the top two most valuable benefits of IT. By capturing teaching material for subsequent access by students, it will meet the growing demand for flexible, technology based course offerings as distance learning becomes an integral supplement to classroom instruction.

Strategic Objectives

- Provide instructors with an easy to use method of capturing lecture content (presentation, audio and video) with automated publishing of this to the web and/or Blackboard. The technology should be simple to use and require little intervention from the lecturer.
- Provide a software delivery system which can deliver software applications to staff and student client devices both on and off campus through a web interface via single sign on from our portal.

Expected Benefits

- It is hoped this will promote the capture of teaching material and will give students subsequent access to class material to meet the growing demand for flexible, technology based course offerings as distance learning becomes an integral supplement to classroom instruction.

## 5. eLearning Design & Development Service

According to the ECAR student technology survey, technology only improves learning when instructors use it effectively. Therefore instructors need an eLearning Design & Development service to support them to effectively integrate technology and pedagogy, to develop instructor technology skill sets, and to increase instructors' awareness of how their students differ in technology savvy and access to technology resources.

Strategic Objectives

- Provide instructors with an easy to use method of capturing lecture content (presentation, audio and video) with automated publishing of this to the web and/or Blackboard. The technology should be simple to use and require little intervention from the lecturer.
- Provide a software delivery system which can deliver software applications to staff and student client devices both on and off campus through a web interface via single sign on from UCD Connect.

Expected Benefits

- It is hoped this will promote the capture of teaching material, and will give students subsequent access to class material to meet the growing demand for flexible, technology based course offerings as distance learning becomes an integral supplement to classroom instruction.

# Research IT Plan

The main goal of this plan is to provide a sustainable and evolving campus Cyberinfrastructure for the UCD research community. We will continue the development and implementation of new services to support research and scale our existing services which we have been building over the past three years. We will continue to work with national organisations (e.g. HEAnet, ICHEC and Grid Ireland) to build services at the core (e.g. equipment hosting, data storage, central HPC facilities and collaborative tools) while supporting edge research services (e.g. data acquisition and instrumentation support).

The IT strategy for UCD (2009-2013) outlines five areas of priority for the UCD Research community and they are:

3.9 Expand hosting and storage capacity for research in the new data centre

3.10 Continuous upgrade of network capacity in conjunction with HEAnet

3.11 Provision of data management service to address the full data life cycle

3.12 In conjunction with ICHEC, provision of high performance compute resources

3.13 Further develop training and support services for research users, including applications

The Research IT programme of work to meet these needs will have the following key areas:

(1) Research Infrastructure

(2) Research IT Support Services

(3) Collaboration within virtual communities

(4) Research applications and tools

A recent EDUCAUSE[1] report highlights the following areas as a focus for Cyberinfrastructure Technologies which supports the direction been taken in the IT Strategy for UCD:

- High-Performance Computing
- Cyberinfrastructure Applications and Tools
- Data Storage and Management
- Advanced Network Infrastructure
- Collaboration within virtual communities

## 1. Research Infrastructure

Research Infrastructure will focus on a mix of building research infrastructure capacity in UCD and using national research infrastructure and industry resources where appropriate. This key area supports all of the Research IT objectives in the IT Strategy document.

It comprises the following specific projects under:

1.1 Data Hosting Centre Capacity
- Build a new data centre in UCD and / or source external hosting capacity

1.2 HPC Resources
- Raise awareness of the new ICHEC/UCD national HPC cluster in UCD and ensure the UCD part of the machine is a fit for UCD researches requirements.
- Build takeup of new UCD 'Phaeton' HPC cluster.
- Evaluate industry cloud computing offerings for HPC e.g. IBM, Amazon EC2, Sun, Google app engine and others

1.3 Server provisioning
- Virtual servers – similar to industry cloud offerings, Research IT have been working with several research groups providing virtual server platforms to address their server and operating systems requirements.
- Evaluate industry cloud computing offerings for server provisioning e.g. IBM, Amazon EC2, Sun, Google app engine and others

1.4 High bandwidth network capacity
- Liaise with HEAnet and UCD networks and ensure network research requirements are met

1.5 Data Storage and Management
- Work with UCD research groups on
  - Data acquisition – the best way to get data from scientific equipment, sensors, surveys etc to appropriate mass data storage.
  - Data Storage – work with UCD Technical Services on meeting continual storage growth.
  - Data Backups – create a data backup offering for research data.
  - Data Archive – evaluate data archive options.
  - Information Lifecycle Management – evaluate ILM options.
  - Databases – evaluate database consultancy options.
  - Evaluate industry storage offerings, e.g. Amazon S3 and others.

## 2. Research IT Support Services

This area is largely centered on developing services to provide support and consultancy for research and innovation in UCD. We will further enhance partnership strategies with UCD researchers and external organisations. Communications with the UCD and national research community is included here. This key area directly supports the objective of developing training and support services for research users, including applications. It comprises the following specific projects under:

2.1 Develop support and advice services

2.2 Improve on-line material which will assist research community

2.3 Communications – review and improve our customer communications

2.4 Training – we will work to scale our existing training programme.

## 3. Collaboration within virtual communities

This area will focus on implementing tools to assist researchers to collaborate within virtual communities. These tools will be based on industry standards, i.e. Web 2.0., and may include using industry offerings e.g. Google apps etc. It comprises the following projects:

3.1 Web conferencing – building on our trials of Adobe Connect and Webex.

3.2 Video conferencing – utilising the soon to be completed Daedalus G4 collaborative space through HEAnet.

3.3 Use relevant software tools and services as required e.g., Identity management and Web 2.0 initiatives.

3.4 Evaluate industry collaboration offerings, e.g. Google apps and others.

## 4. Research applications and tools

This area is about developing services to assist researchers with access to applications and programming tools. It comprises the following projects:

4.1 HPC applications - job scheduler, parrallelisation, compilers and application packages. We will leverage ICHEC application suite and skills and implement on UCD cluster where appropriate.

4.2 Visualisation – implement 3D prototype in Daedalus G4.

4.3 Programming, data mining and database provisioning – define user requirements and work with community to develop services in this area.

[1]EDUCAUSE is a US based nonprofit association whose mission is to advance higher education by promoting the intelligent use of information technology. EDUCAUSE helps those who lead, manage, and use information resources to shape strategic decisions at every level. The current membership comprises more than 2,200 colleges, universities, and educational organisations, with more than 17,000 active members.

# Administrative Systems Plan

All administrative areas within UCD have benefited from the deployment of a range of administrative "back-end" systems over the past ten years. Furthermore, over the past three years, most of our main high-volume processes have been replaced with new online services – many provided by standard packages.

Looking forward, the IT strategy for UCD outlines five new objectives to build upon this foundation of existing administrative systems and online services. These are:

3.14 Provide web-based user-driven services for key processes

3.15 Address the need for management information and reports

3.16 Provide staff with comprehensive office productivity tools

3.17 Develop a prioritised information systems plan in conjunction with users

3.18 Ensure integration of information across systems

The following four programmes of work are proposed to meet these objectives and bring administrative systems in UCD to the next stage of development. They focus more strongly on enhancing services to our many user communities than on developing infrastructure or backend capabilities. The four priority programmes are:

(1) Online Services for Staff and Student Programme

(2) Management Information Programme

(3) Office Productivity Programme

(4) Identity Management & Access to Services Programme

## 1. Online Services for Staff and Students Programme

This programme of work will deliver consistent, high-quality, online services to three targeted communities - academic staff, administrative staff and students - in support of the T&L objectives of the university. It supports strategic objective 3.14 – *provide web-based user-driven services for key processes*. The programme comprises the following specific projects:

Service Delivery Projects

1.1 Curriculum Management Module (underway)

1.2 Upgrading the user interface to Online Applications (for both applicants and staff)

1.3 Provision of systems support for graduate recruitment

1.4 Upgrading the user interface to SISWeb to enable academic staff to view class lists and contact their students in an easier way

1.5 Upgrading the user interface to Gradebook and including reporting within a single interface

1.6 Providing system support for the management of student contact (administrative and academic)

1.7 Making the user interface to SISWeb and Online Registration more consistent for students

Projects to Build Capacity

1.8 Definition of a "service orientated architecture" which provides the technical underpinning to support the above

It complements existing work on the delivery of web services to researchers and has the potential to extrapolate into Finance and HR services.

## 2. Management Information Programme

This programme aims to provide clear, timely, relevant information to support processes and decision-making at all levels in the organisation. It supports strategic objectives 3.15 – *address the need for management information and reports* and 3.18 – *ensure integration of information across systems*. It comprises the following projects:

Service Delivery Projects

2.1 Refocusing the delivery of information at specific roles (e.g. Head of School) rather than the functional approach.

2.2 Developing an information portal – UCD InfoView - with a high-quality user interface which provides an easy-to-access location for all information within the university

2.3 Develop a more service-orientated approach to communication, support and training in the area of information availability.

Projects to Build Capacity

2.4 Developing and deploying a data warehouse to improve the speed of reporting and reduce the effort required to deliver information to end-users

2.5 Investment in integration to cover known information gaps and inconsistencies between different systems – e.g. in the areas of space, energy, library, IT facilities

2.6 Development of new data sources – particularly qualitative information such as student satisfaction, staff satisfaction, quality in teaching & learning etc

## 3. Office Productivity Programme

Our office productivity software (primarily Microsoft Office suite) is our most pervasive application in UCD and management of documents and emails remains our largest administrative activity. This programme aims to utilise UCD SharePoint to provide a rich set of tools and processes which allow all areas of the university to improve the way they manage documents and emails. It supports strategic objective 3.16 - *provide staff with comprehensive office productivity tools*. It comprises the following projects:

Service Delivery Projects

3.1 Definition of a "model office" within UCD SharePoint covering document management, email management, calendaring and common administrative activities such as procurement, project management, staff management

3.2 Deployment of the model office to HR and other early adopters

3.3 Automation of processes within HR

3.4 Investigating requirements for calendaring and other Microsoft Exchange functionality

3.5 Rollout of the model office across the campus

3.6 Replacing existing legacy document management systems including (XTender & Adest)

Projects to Build Capacity

3.7 Infrastructure build-out to full production environment of UCD SharePoint

## 4. Identity Management & Access to Services Programme

This programme is about understanding who our users are, what their roles in UCD are and what services and information they should have access to. It will enable quicker and easier access to online services within the UCD network and is an important enabler for the other three programmes of work. It supports strategic objectives 3.14 – *provide web-based user-driven services for key processes* and 3.18 – *ensure integration of information across systems*. It comprises the following projects:

Service Delivery Projects

4.1 Simplifying the process which creates accounts (& identities) for users

4.2 Implementing a new single password / sign-on mechanism for all systems

4.3 Providing a mechanism to record non-staff / non-students consistently along with the services they require

4.4 Providing a mechanism to consistently record roles which people play within the university and use them to drive access to information and services

4.5 Providing each staff member with an ability to manage key personal information such as location, contact details etc.

Projects to Build Capacity

4.6 Implementation of an "identity management" product to provide the foundation for the delivery of online services

4.7 Creation of a central identity repository to ensure a consistent understanding of all users in UCD, their roles and the services they require.

## Ongoing Information Systems Planning

Objective 3.17 of our IT strategy requires that we *develop a prioritised information systems plan in conjunction with users*.

IT Services undertake an annual work programme planning process that prioritises projects to address the needs of all areas of the university. Each year, an overall superset of such projects is drawn up in consultation with our users. This list includes regular upgrade and maintenance projects as required. This superset is then prioritised and approved by the Administrative IT Steering Group.

All projects are managed using the Project Management Framework methodology which was adopted in 2007.

A formalised Change Request process is also in operation for smaller pieces of work (<10 days). The JIRA system tracks all such requests and a fortnightly meeting with users is held to decide priorities.

# Web Services Plan

The UCD Community has benefited from the release and improvement of a number of web-based services over the last three years. Looking forward, the Web Services strategy for UCD outlines four new strands or programmes to build upon this foundation of existing services. These are:

3.19 Ensure the UCD Web is easy to use and manage.

3.20 Develop portal services to meet the mobile and access needs of staff and students.

3.21 Implement single sign-on, improve UCD Connect interface and improve performance.

3.22 Develop the Web architecture and provide more advanced web technologies to meet future needs (Web 2.0).

These four programmes focus on enhancing and augmenting existing services to our customers together with continuing to provide for service continuity and performance.

## 1. Ensure UCD Web is easy to use and manage

The objective is to provide a measurably improved experience to people visiting the UCD Website together with providing straightforward solutions to web publishing within UCD for both internal and external customers.

Component Projects

1.1 Continued implementation of CMS together with a review of the information architecture at each site.

1.2 Phase II of the Google search implementation will include searching UCD databases, optimising search for specific collections, and provide for highlighting specific courses or services.

1.3 Design and implement the UCD Intranet providing customized services for UCD internal use.

1.4 Contribute to projects for design revisions taking place on the main UCD pages.

## 2. Develop portal services to meet the mobile and access needs of staff and students

This programme aims to provide a one stop shop for the majority of customer requirements, allowing for significant personalisation to meet more specialist needs. Anticipating widespread laptop usage, all services will be developed with mobility in mind.

Component projects

2.1 Identify additional/improved services to be delivered via UCD Connect.

2.2 Continue to contribute towards the development of the next generation of UCD Connect.

## 3. Implement single sign-on, improve UCD Connect interface and improve performance

Single sign-on (SSO) is provided through UCD Connect to a number of distinct services including E-mail & Calendar, Library eJournals, Blackboard, storage via Connect Files and Netstorage, SISweb and 'Software for U' together with a number of smaller elements such as Anti-spam sign-up and Rightanswers knowledgebase etc. A more agile and sustainable method for SSO is required.

A review of the Connect interface together with the services to which it is linked (see above) is an important step on the road to providing a more coherent set of services to the UCD community. The facility to personalise the environment, available in the existing environment, will be upgraded to make it more accessible to the customer.

The performance of Connect (and associated services) is a critical factor in its success. This is brought further into focus with the continued adoption of laptops and wireless services.

Component projects

3.1 Establish an enterprise integration methodology for current and future needs.

3.2 Establish common themes throughout the interface of UCD Connect and associated services.

3.3 Monitor performance of Connect and other services and develop a framework to proactively improve performance.

## 4. Develop the web architecture and provide more advanced web technologies to meet future needs

Managing the extensive and distributed set of web-based services which are delivered throughout UCD is a complex task. The web interface extends across all applications and information – Teaching & Learning, Research, Administration and the resources provided by Colleges, Schools and Institutes. To capitalise on these developments a UCD Web Architecture will be developed to provide both flexibility and consistency in our Web Services.

Additionally, a number of new technologies now exist in the collaboration, T & L and distributed computing spheres. Over the longer term the objective would be to assess, and where appropriate, to migrate to Web 2.0 technologies, introducing more interactive and comprehensive web services. A flexible and distributed approach to web development will be required, based on an agreed architecture.

Component projects

4.1 Revise web architecture to provide for a solid foundation for the development and scaling of services.

4.2 Assess the impact of web 2.0 technologies in other leading universities. Work with UCD customer groups to establish requirements for services based on these technologies.

# IT Architecture Summary