

UNIVERSITY OF CAMBRIDGE

ISSS

MANAGEMENT SYSTEMS STRATEGY WORKING GROUP

The purpose of this document is to outline the future strategy for Management Systems over the coming years. This paper along with several others commissioned by the ISSS will be collated into a single System Strategy Document for the whole University.

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Management Systems Working Group

1. INTRODUCTION

The terms of reference for the working group established by the ISSS are defined as: “To develop an information strategy for the next five years for management systems for administration, schools, departments and staff which outlines needs, customers, emerging trends, good practice, and informs implications for strategy and delivery in the context of current circumstances.”

2. VISION

Our core business processes encompassing operations across the Collegiate University will be supported by fit-for-purpose business systems. On-going development in these systems, and an understanding of their importance and the benefits they contribute to the University, is essential. The systems will by their design, quality of support and usability encourage use and take-up across the University.

Leadership is essential in taking forward the strategic plans that are developing for the core business process areas, and the associated systems development. This leadership will build upon the current good practice that is evolving through the work currently being undertaken.

Collaboration between institutions requiring business services will continue to develop and build upon the achievements made to date (e.g. CamTools and CamSIS, the partnerships between MISD and the Clinical School and Institute of Continuing Education, between the UAS Directors and Heads of Schools and non-School Institutions, CamSIS and the Colleges, and the Research Office/MISD and University of Oxford).

Without strong direction, the University will remain unable to gain the benefit of universal core business systems. The necessary process changes will never gain widespread acceptance without strong leadership. The UAS through MISD could be empowered to take the initiative to steer the development of business process change and associated systems. While there is some business change expertise in MISD, this is stretched and consideration may need to be given to providing a different staff skill profile in order that such a leadership role would be effective.

3. CONSULTATION

A rapid survey was undertaken by approaching the Secretaries of the Schools, and selected Faculty administrators, to ascertain where we are now and inviting suggestions.

Responses were received from:

- Secretary of the School of Arts and Humanities
- Secretary of the School of Biological Sciences
- Secretary of the School of Clinical Medicine
- Secretary of the School of Physical Sciences

Secretary of the Faculty Board of Biology
Secretary of the Graduate School of the Life Sciences
Secretary of the Faculty of Economics
Secretary of the Faculty of Education
Secretary of the Faculty of Law

Inputs were also received from School Finance Manager and Assistant Secretary of the School of the Humanities & Social Sciences.

The College perspective was provided by the Bursars IT and Telecoms Group.

The results of the consultations, as they are mostly areas where improvement is required, are shown in annex 2 below.

4. USERS AND CUSTOMERS

As part of their vision statement, MISD¹ have the following statement within their strategic objectives to define the customers for their services:

“With the increase in the use and complexity of systems, and the capabilities available to the general public (e.g. online banking, shopping, www.gov.org.uk) the expectation of users for an exceptional user experience when using our systems is now a measure of a modern and responsive University. Potential applicants, parents, funding bodies, students, alumni and staff will judge the University on our services. Therefore usability of systems and the ability to interact, share information and communicate with our systems through multiple interfaces is now a critical part in the selection and development of our services.”

In developing our systems it must be acknowledged that services are provided for people with different levels of skills and needs who work in a wide variety of institutions and differing roles. By considering the needs of different users, defined through the use of typical user profiles and role descriptions, we can translate user needs into technical developments, using iterative and user-centred design processes. An example of some of the different roles is described in annex 1.

5. CONTEXT – UNIVERSITY MANAGEMENT SYSTEMS

The University receives substantial public funding and has to be transparent and accountable for its use of those funds. There is an externally-imposed regulatory framework in which we work and we have to demonstrate compliance with that framework. Historically, management information systems have been focussed on our external reporting needs. The University now meets high standards of data credibility with the statutory authorities such as HESA and HEFCE. This is a necessary but not sufficient reason for the investment in common business systems such as CUFS and CamSIS and CHRIS.

The University has a strong internal culture that celebrates individual autonomy and the preservation of that autonomy is considered essential to the attraction and retention of the best and brightest academic colleagues. There is an impression that the common business systems challenge that autonomy.

¹ Management Information Services Division – Strategic Objectives 2011-2015

Yet within the University and in spite of an impression of considerable diversity, there are common underlying processes that are susceptible to shared systems. Where shared systems are appropriate and a system is well chosen, considerable savings of time and money are possible. Our use of central shared systems has reached the point at which this is beginning to be evidenced, but the reality is not yet apparent to all members of the University.

As noted above, the University has made considerable progress in the introduction of 'enterprise systems'² for regulatory reporting/compliance, but there is a legacy lack of trust in central service provision. Perceived problems in the past with data quality and data availability have led to wasteful duplication of effort and systems. The 'usability' of enterprise systems is widely criticised, but paradoxically the information they hold is increasingly trusted and relied upon. Reliable data has been valued above an attractive interface, but as expectations for reliable data are increasingly satisfied, demand for better interfaces is growing.

Systems that support external reporting and compliance are not always suitable for internal management purposes, but it is advantageous for them to use common data sources. There is considerable dissatisfaction with the availability of information held in central systems for re-use in support of local decision-making and planning.

Certain business processes are core to the mission of the collegiate university and others have broad, but not universal, relevance across its constituent institution(s). Some of these business processes relate to external reporting, but others relate to the internal management of resources. For the latter there are network effects that mean effectiveness and efficiency can be maximised with a shared system. The University's strategy should be to identify such core processes and to deliver useful, usable systems that realise those efficiencies. As a result, data quality will improve, overall costs will go down, and life will be made easier for the users of such systems.

MISD is responsible for procuring and delivering University-wide shared systems. In doing so, the University has been learning about managing large IT projects and MISD has progressed to providing support in their use locally outside the UAS. This trend is expected to continue and the comments to the group call for considerable further development in the areas of user engagement; business analysis at the pre-procurement stage is significantly relevant in this regard.

6. BUSINESS DRIVERS

UAS reviewed the challenges and business drivers upon the University during a series of senior UAS managers' workshops in 2010. Some of these are reproduced here to provide some context for the future development of our management systems.

a) External Influences – An increasingly Global Market Place

c) Examples of Internal Changes within the University

² Enterprise Information Systems provide a technology platform that enables organisations to integrate and coordinate their business processes. They provide a single system that is central to the organisation and ensure that information can be shared across all functional levels and management hierarchies.

- Leading Universities are increasingly operating on a global stage for research students and academic staff
- Overseas students have a wide choice of destination – and the UK has some particular barriers to entry (e.g. immigration controls)
- At a time when the UK is reducing funding, other countries are investing
- Technology developments are changing the nature of the institution:
- The nature of the implied student contract is changing
- Increasingly global focus – research partnerships, annual sponsorship of 3,000 overseas students
- New collaborations e.g. Cambridge University Health Partners, Cambridge-India Partnerships
- Development of west and north-west Cambridge sites

d) Implications of these factors for the University

b) External Influences – UK specific issues

- Profound impact of the economic downturn on Government finances
- Increasing and rapidly changing regulation and compliance requirements
- Greater scrutiny of performance – with consequences for reputation and funding
- External pressure to align with Government agenda – e.g. widening participation initiatives
- General pressure on public bodies to be more transparent and provide information e.g. FOI
- Changing client needs – internal and external
- Greater expectations of service within and beyond University
- Increase demand for quality management information
- Increased pressure to respond flexibly and fast to new demands
- More demand for effective governance and decision making
- Requirement to demonstrate value for money
- More programmes requiring an integrated solution – from Institutions and the UAS

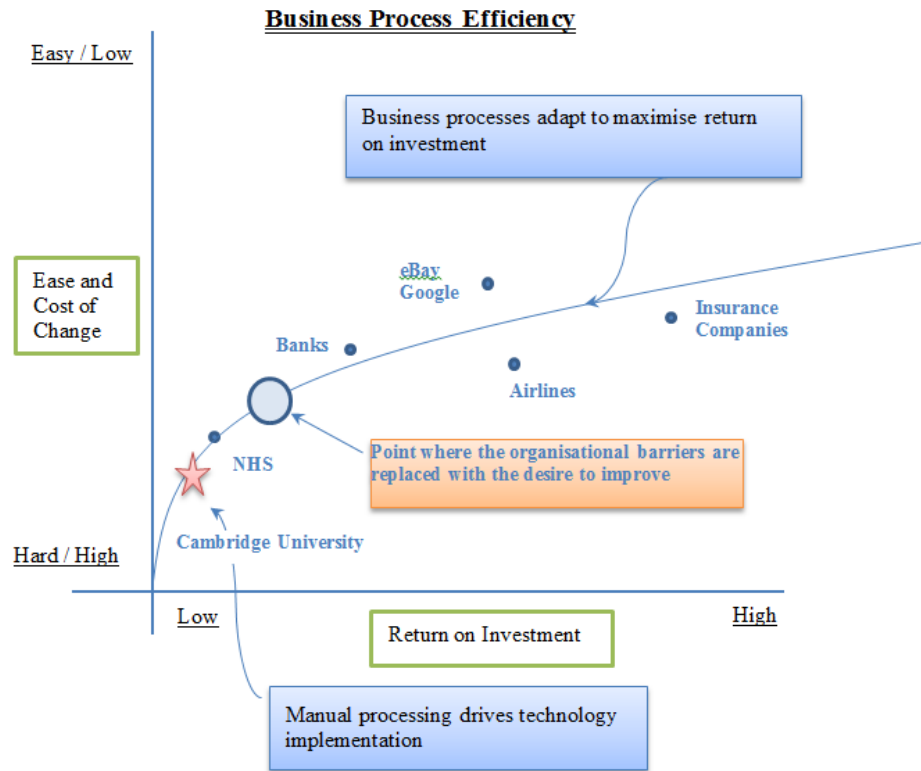
7. COMPARATIVE POSITION OF THE UNIVERSITY

The chart below positions the University with respect to commercial organisations that are often cited as leaders in innovation with regard to use of Information Systems. All of these organisations have been driven by commercial needs to compete in delivering customer service and efficient and effective administrative services.

In the 1990's, industry had a big dip in profitability prior to the recent economic downturn, and this forced companies to look for methods of reducing their overall costs and improving efficiency. The University has, until now, not felt this pressure to reduce costs so strongly and this places us at least 15 years behind commercial business in systems and process development.

Furthermore the new funding regime, particularly for students, will raise expectations for service delivery across the University, and this is predicted to include the need for first class information and administrative systems.

The most dramatic changes in business management are the introduction of on-line and electronic business systems and the drive towards self-service and entry of data at point of origin to reduce costs and improve services. This is now the norm. A comparison with other universities, whilst interesting and valid, does not provide sufficient future direction as many of them are in a similar position to us.



8. CULTURE & BARRIERS TO CHANGE

The University's culture of independence has driven the development of small bespoke systems that satisfy individual and specific department needs. Each institution in the University, rightly or wrongly, strongly defends its independence and right to operate in many ways as a self-sufficient entity. This creates difficulties when business needs change and a collaborative approach is required to reach a common solution, for example statutory reporting to Government. CUFS, CamSIS, and CHRIS have all experienced this culture. A large step has been made with the implementation of CamSIS and the rollout across all departments and Colleges. The lessons from the rollout of CamSIS need to be capitalised upon in the plans for new core systems; on-line student applications, staff recruitment and training administration, for example, are all benefiting from a collaborative approach.

Implementation of the large systems has been constrained by the desire to replicate our historic processes without modernising them. We have a legacy of business processes

which have been developed in paper form over many years, and are managed by individuals that have not experienced the advances and advantages that technology brings. Previous lack of experience and thus little drive to change and improve business processes has limited the benefits of these systems. With the more recent recruitment of staff from the private and external research sectors, and from HE institutions that are further along with these developments, there is a greater will to modernise processes and capitalise on our system investments.

The current financial constraint on the HE sector is driving the need to reduce costs and has creating a growing understanding that we must derive more value from our systems. The drive for business process improvement, improved management information and ease of use are overcoming the desire not to change.

In overcoming the barriers to change we must be willing to use robust commercial applications for central systems supporting core activities, without diluting the culture of creative diversity or compromising academic freedom . There are processes which are unique to universities, where we should aim to be leading amongst our peers in the development or commissioning of systems. We should focus our in-house skills on bespoke and small scale development for these unique requirements. There is a greater understanding that systems must be easier to use, require minimum or no training and be open to the transfer of data from and to other systems. With new technical capabilities available (especially web-based applications) this is becoming possible for both our commercial and in-house developed systems.

9. STRATEGIC INITIATIVES - MANAGEMENT SYSTEMS DEVELOPMENT

Our focus on entering data at source, providing integration between systems and access to information where required should continue and drive our development plans. We have started to improve the interface to systems which is becoming evident in applications such as CamTools, the newer parts of CamSIS, the on-line recruitment and expenses projects, and the increasing use of small commercial web-based applications. Using iterative and/or user-centred design techniques in the development of our systems will make them easier to use and encourage wider take-up by users.

There are gaps that need to be addressed in our Business systems portfolio. These have been identified and work is progressing within the financial limits of the funding. The MISD Strategic Objectives 2011-2015) provides a reference to the initiatives already underway and planned.

MISD Strategic Objectives 2011-2015 (those covering the development of the central systems under the responsibility of the UAS)

8.1 Administrative Systems

- Introducing Electronic Document Management (EDM) capabilities to enable business process improvement through the use of on-line resources and access to information and documents, and the ability to provide Workflow capabilities to improve administrative processes. This capability will be made available across the University for Institutions that will benefit from the use of EDM

- Introducing additional capabilities to manage web content for users to create, analyse, and optimise site content, run campaigns and targeted user experiences is a pressing need. Moving this away from the domain of the IT technical specialist, we will introduce for users productive, easy-to-learn, fun-to-use authoring environments with support for in-place editing, drag-and-drop page composition for rapidly development, deploying new templates, designs, and web components to business users
- We are working with the Academic Division to improve the services and efficiencies of student administration following the implementation of CamSIS across the Collegiate University. Using structured business improvement methodologies a comprehensive review of all processes, including interactions across Colleges and Department, is being undertaken. This will lead to some restructuring in the Student Operations area to combine the activities and services which they are currently providing for students and Colleges into a Student Services Centre in Cambridge, with administrative support from the Integrated Service Centre (ISC).

8.2 Services for Research Activities

We are planning to develop a portfolio of linked services and systems to assist researchers and research administrators when they are required to apply for research funding and ensure they have the tools to assist with the costing and management of the funding throughout the lifetime of the grant. Potential services include:

- Establish a process and a system that will help the University to manage the corporate relationships with our sponsors and funders and will easily allow the sharing of suitable information with the relevant interested parties under suitable guidelines from the relevant University committees
- Introduce a capability for use when research is underway and after completion, to assist researchers and research support staff with the tracking of publications, impact, and other outputs such as engagement with the public. There is also the need to comply easily with any requests made for data under the Freedom of Information requests (FOI) and the Research Excellence Framework (REF)
- A strategic initiative for the preparation of Research Grant applications (costing and pricing) is underway in partnership with the University of Oxford and a commercial partner. This is the first phase in a range of improvements supporting the research community in the administration of Research Grants. The choice on a commercial partner provides opportunity for further integration with their financial and customer records management applications based upon the same platform
- Provide comprehensive post award financial management capabilities for the researcher and the department and the Heads of Departments housing the research to assist with tactical and strategic planning

8.3 Student Experience

- Alignment of the CamSIS and CamTools services, and future joint developments with CARET³ to provide cohesive and integrated platforms, that provide improved services for students, academics and administrative staff involved in teaching, learning, and student records. We expect there to be a future review of Virtual Learning Environments (VLE) in Cambridge, where a strategy is developed for collaboration technologies in teaching and research. A pilot of Sakai 3.0 is proposed for 2011/12 also reviewing Google Apps for Education (free without adverts). Looking further ahead to 2014 and beyond there will be on-going research into other group collaboration tools
- The introduction of student on-line registration capabilities will provide benefits to students, parents, colleges and departments through early indication of choices, information for funding and early contact with students for forward planning. The next phase of moving all student applications for undergraduates, graduates, home and overseas students to on-line applications, references and document submissions will complete in 2011/12, followed by work to extend services to the wider audience described above
- In the current competitive climate reaching the very best students internationally and at home is an imperative. Top universities are now using commercially provided services where potential students complete a single application process which can be submitted electronically to several universities. These services significantly improve the experience of applying on-line, therefore to maintain our competitive position we will review the use of these capabilities from vendors such as GTI (Hobsons) and Embark, to establish which services we require in each Global market

8.4 Staff Services

- A significant number of the business processes associated with staff administration are manual and paper based (word documents/spreadsheets). Following the introduction of the new HR system (CHRIS) we are systematically replacing these processes with on-line and workflow processes. The introduction of employee self-service capabilities, for example, on-line payslips, course booking, leave and absence recording, are the first phase of this work
- Revisions to the Staff Review and Development (SRD) scheme are being considered by the University Council and General Board with the intention to provide on-line appraisal and career management schemes for all staff, including researchers and academics. We will be implementing through a series of related initiatives capabilities to support these revisions to the SRD scheme
- Staff payments are still partially a manual process, however with the introduction of CHRIS, our strategy is to move all staff payments on to a single system, with the ability to enter and process overtime, expense and modified pay on-line and process automated payments (BACS). Staff Self Service access to these services will allow employees to submit and track claims, to view payslips and tax information online, and to obtain bank/building society letters. These services will be available for use by other Institutions in the Collegiate University

³ Centre for Applied Research in Educational Technologies

- The introduction of a new business system to improve the scheduling, time and attendance of staff working in the University Library, and other labour intensive departments will improve the effectiveness of this complex administrative task, and create a new service that can be used within other Institutions where staff scheduling is a major administrative overhead
- Working with departments and other Institutions we are introducing a modern web-based recruitment and references system aimed at attracting new staff and improving the recruitment experience for applicants and recruiters in the University. The capabilities will enable the University to market the benefits and advantages we provide as an employer through the recruitment system

8.5 Business Information

- There will be a reporting and management information review to deliver a complete reporting solution in 2012/13, including a strategy to deliver a comprehensive management information service. MISD have started planning the development of an Information Hub to integrate Student, Staff and Financial information to provide access to electronic data that is then made available to others systems through a single standard interface.
- Management reporting and access to data from our core business systems is under review and work is in progress to address HR data and high level management reporting. A review of financial reporting is being carried out in the Finance division. These initiatives will lead to programmes of development work over the next few years.

8.6 Financial Systems

- A strategic review of our Finance and HR systems to plan the future direction of these two key services is now underway. Securing the long term viability of the Cambridge University Finance System (CUFS) as the current system (Oracle version 11.5.10) becomes end of life in 2013 is a priority. Development of this future strategy highlights the importance of broad consultation in the planning and decision making. A University Steering Group will oversee this review, followed by a formal project for implementation during 2012-14

10. PRINCIPLES FOR SYSTEM DEVELOPMENT

- All systems should be integrated where possible, (e.g. Finance, HR, Student, Research Grants) with the ability to exchange information as relevant to the system, plus provide the ability to export data to other systems in a controlled and secure way.
- Reporting (both formatted reports and free data extracts) is a key component of any system/s and should be given much greater priority. Reporting should be on-demand, reliable, accurate and available from multiple key systems.
- Data entry should be closest to source and once only. Systems must eliminate duplication of effort as part of their implementation.

- Systems must be user friendly for the occasional user as well the frequent user, with modern user interfaces that encourage the use and adoption of the systems.
- Greater emphasis should be placed on business analysis, planning, requirements gathering, and expectation management in systems development.
- Change management for business processes and the adoption of new working methods to maximise the benefits of new systems should be widely considered and part of the system proposals at the planning stages.
- Not all systems can be all things to all people, therefore determining the user needs and profiles for each system development is critical.
- Current systems should be subject to post-implementation review and analysis when planning new systems, and lessons learnt applied.
- The University should promote a vision of its long-term aims and make sure every new piece of software/application/development is a step in that direction; a strong communication strategy and widespread buy-in will be required for this to succeed.
- Simplified access to systems is essential; a single log in screen to access all applications is the ideal we should aspire to.
- System developments (large and small) must ensure wide engagement with users and institution heads
- All new system developments should include a clear retention and archiving policy since there will not be infinite storage capacity and systems become slow and unreliable once they are saturated.

11. SUMMARY RECOMMENDATIONS

- a) Core business processes should be identified and supported by robust business systems;
- b) Leadership will be necessary to implement comprehensive business systems with associated process and cultural changes;
- c) The pace of change must be accelerated given the compounding internal and external drivers;
- d) The University should continue to develop our capabilities in business analysis, defining organisational needs, developing systems for usability and change management for organisational change,
- e) Systems development must be guided by the principles outlined above.

Annex 1

Typical user Profiles	Example of requirements
University member of staff	Access to personal information, claiming expenses, e-mail, maintaining own web pages
Academic	Providing student access to teaching materials, own website, class lists, access to student records
Researcher	Creating and managing Grants, researching information, collaborating with fellow researchers
Administrator	Conduct administration activities
Student	Access course information, notices, registration, exam enrolment
Potential Student Applicant	Details of courses, options, college information
Potential University Employee	Access to; benefits packages, organisational structures, University information (reporter etc.)
Parent	Financial services, Student support and welfare
Referee	Providing references
Alumni	Keeping in touch, events
Potential Employer	Access to degree certificates, references
Colleges	Access to student records, down load data into College systems
External Funding body	Access to management information
Secondary Education school	Access to application information, academic statistics, course information
University School	Access to management information
University Department	Access to large data sets for departmental usage

Annex 2

Current Issues identified through the consultation process

1. Staff information

- 1.1. We lack the ability to be able to use the HR system to easily provide information on groups of staff by various criteria and source of funds. Improved Department and School level reporting is required. Access to the current HR Burst report is problematic for some and there is often a need to wait for a report to be produced to trigger a process e.g. who is eligible for a current exercise.
- 1.2. Event reminders remain useful e.g. for contract end processes.
- 1.3. There is considerable potential for direct entry of data to a single source for multiple access, e.g. for applications and references in the recruitment process, but the system will have to be comprehensive to be useful i.e. be able to accommodate additional application materials. Similar challenges apply to student applications systems.

2. Student information

- 2.1. There is not full confidence in CamSIS as the definitive record of students, especially before and during Michaelmas when admissions are being finalised, and some Faculties retain their own databases in parallel until the CamSIS output is deemed to be robust. This will be partly about data entry processes and partly about reporting. *(The Administrative Process Review is addressing this issue)*
- 2.2. One area in which CamSIS in particular could do better on is providing a way of managing work flow across populations of, say, applicants for admission. At the moment almost all steps in this process are triggered by the arrival of paper documents. The intention is that these will disappear in October 2011, with the introduction of the electronic document management system
- 2.3. Current systems are cumbersome and not user friendly. A high level of training is required for a low level of return. We lack a simple report for monitoring progression of, for example, PhD students.
- 2.4. Fundamental course information is not readily accessible e.g. number of students on a Tripos, structure of course, who teaches it, regulations all would be assemble from multiple sources.

3. Research grant information

- 3.1. The availability of financial research information is particularly poor. This is the case for grant management, where live access to CHRIS and CUFS could provide real time picture of all commitments against a grant. Also for planning purposes, where the current Research Model, based on existing grants and projection assumptions, fails to produce a sensible answer without considerable adjustment. *(The review of CUFS this year includes the requirement for improved Research Grants Management)*

4. Finance information

- 4.1. CUFS Excel extract reports are available but they are cumbersome; more user friendly CUFS reporting is desirable. *(A review of Financial Reporting is currently being undertaken by the Finance Division)*

5. Facilities information

- 5.1. There is considerable duplication of effort and gaps in terms of managing facilities e.g. maintaining a record of people in a Lab – a single interface between CHRIS and CamSIS would capture both staff and PG students (visitors and CTOs also if there is a category for these in CHRIS) to keep track of who has access to a space and its resources (energy, communication etc.).
- 5.2. Researchers would like more information on where facilities are around the university (equipment and data to support research) and who to contact to request usage.
- 5.3. There could also be benefits in improved live information on the physical infrastructure at Department and School level e.g. to monitor energy use etc. against activities and provide live data on carbon usage.

6. Proceedings

- 6.1. Circulation of, and access to, University Committee papers and official documents e.g. Reporter could be improved by providing central space for download on demand saving multiple file circulations and storage duplications. (*The EDM project is addressing the management of University Committee papers and will implement the 1st pilots during Easter Term 2011*)

7. Integrated systems for management, planning and operations

- 7.1. Generally our data are not always easily interpreted, generated or reported.
- 7.2. There is a universal call for systems to talk to each other. The integration of CHRIS, pFact/x5, CUFS, CamSIS or their successors would join all the gaps in knowledge. We need to link all systems and have single source to avoid duplication of efforts and multiple updates. (*NB There are interfaces between these systems for certain data sharing and the Management Information project is looking to address some of these needs*)
- 7.3. Ideally there would be a top level view which could be drilled down into including, student profile, staffing profile, financial information, research activity, available by Department (and other levels) from a single web-enabled access point.
- 7.4. A live stats site could provide a Department view of student numbers, researcher numbers, grants etc.
- 7.5. A gathered field of information could address basic management questions e.g. what is the cost of delivering a course? Or what are the staff levels relative to activity levels in various areas? Issue like these can only be address by patching together information from several, often unsynchronised, sources off-line.
- 7.6. It is problematic where staff are registered for graduate degrees. The HR systems does not know currently register which staff are students.
- 7.7. In addition we could improve with:
 - 7.7.1. an information policy which clarifies responsibility for creating and maintaining staff and student records and for retention of staff and student records, eliminating duplication of effort in filing and storing data in central/school/dept units (to be shared across e.g. central administration/Faculties/Colleges and to include more than one role - input and validation for example);

- 7.7.2. systems training which focuses on advanced use as well as getting started;
- 7.7.3. planning processes which make full use of our information sources e.g. single points for staffing and student numbers information to replace multiple overlapping data collection processes;
- 7.7.4. a comprehensive workable archiving system.