THE UNIVERSITY of York

INFORMATION STRATEGY GROUP

Information Needs of the World Class University

1.   Introduction & Method

The scope of this review was to consider the information needs of the world class University, in order to develop a new information strategy for the University of York.

The method of data collection has been to consult widely internally and externally. The method of collation has been through the work of the Information Needs of the World Class University Working Group, chaired by the now Deputy Vice Chancellor. Membership of this group is given at Appendix A. This report is therefore a distillation of views and comments from a broad range of staff, students, suppliers, and industry sought over the past year. It has been drafted and edited by the Director of the Computing Service and the Director of Library & Archives.

The layout and format of this draft report can be summarised as:

- An analysis of the features and trends in the environment which will affect information systems and drive our plans and responses
- A brief commentary on our current performance and competitive position in this area
- A statement of the future requirements presented under the headings of various user groups
- A broad brush statement of the future systems we need to put in place to meet these requirements
- Some thoughts on the benefits accruing from investment in this area, and the measures to gauge the success of the strategy
- A summary of the proposed programmes necessary to achieve the strategy

This version is for wide consultation and expert comment. Following this a more detailed document will be prepared with project definitions, costings, and an implementation plan.

2.   Background

York is a world class University. It has a clear future vision and its corporate plan calls for further growth in capacity, capability, reach and reputation whilst retaining the University's considerable traditional strengths. A growing organisation is unlikely to retain a distributed, friendly and collaborative culture without increased attention to its underlying information and communication systems.

Effective information systems are the cornerstone of most successful modern organisations. Higher Education institutions are in the knowledge business, and require systems for accessing, collecting, sharing, analysing, synthesising, critically appraising, and adding value to existing information, as well as for managing the institution, and delivering information to support the core processes of teaching, learning, creating new knowledge and knowledge transfer. Information and communication systems also support the University's global brand and reputation.

The scope of this report is broader than technology; many of our information systems are not solely technology-based, or bound by particular media. Technical solutions are not always the best. In particular the human, social and managerial processes involved in data creation, communication, and information service provision and delivery need to be understood and planned for. In particular this report tries to encapsulate the potential contribution and importance of information systems to the life of this academic community.

The University's activities and aspirations will require world-class approaches to the management of information and knowledge assets, and these will be underpinned by world-class information systems. The University will need to develop best practice in the management of its own knowledge creation and delivery processes, and in the exploitation of its knowledge assets to the global audience.

3.   **Context & Environment**

This section presents an analysis of the factors arising from the environment influencing our approach to information. These are arranged under the four standard analytical headings plus one listing specific University of York local factors.

Political & Legal

- The globalisation of Higher Education, leading to international competition for students, staff and business
- Increased student expectations, partly arising from fee payment, leading to higher service quality standards and an internationalisation of choice
- Greater regulation resulting in a more complex environment, making information systems more critical for mitigating risk as well as supporting more complex processes

Economic

- Universities increasingly needing to conduct themselves in a more business-like way to compete in the global market, requiring better data on costs and benefits
- The growth of knowledge-based economies, demanding a higher national skills level
- More universities working collaboratively with industry to provide missing knowledge and design elements
- More virtual organisations, partnerships and collaborations
- Demand for more varied interactions with the University; including Continuing Professional Development (CPD) and Life Long Learning (LLL)
- Dependence for information resources from a scholarly publishing industry in state of transition, with digital replacing print quickly in some areas, but not in all
- Open access movements restructuring scholarly communication processes and economic models

Social & Cultural

- An increasingly diverse student and staff body, with variety in age, ethnicity, and social background
- Different generations using information differently
- A worldwide audience for University education and a need to respond to this in communications and information systems
- Academic working moving towards more inter-disciplinarity and collaboration
- Increasing social responsibility and awareness of green issues, demanding related strategies and information to attain and defend a position
- Work-life balance
- Many students and some staff are now digital natives, but not all, resulting in more variation in information skills levels than hitherto
- The information society
- Demand for remote and mobile methods of study and working

Technological

- IT continuing to change at an increasing rate
- High speed connectivity becoming a standard
- Use of portable, mobile and wireless technologies, but not all of these predictable in take up
- Information resources increasingly available in digital form, and increasing demand for traditional resources to be digitised and stored in repositories
- Increasing use of technology for social networking
- The ubiquity of the web for access to information sources
- Costs of equipment and storage falling; but increasing demand for bandwidth, storage and processing power as well as increasing costs for energy and management and support
- Demand for simpler access to information systems and services generating search and discovery tools and portal developments

The University of York Context

- Growth
    - Preservation of community feeling and communication
    - Geographical implications of a larger campus
    - Preservation of a flat organisational structure
    - Ability to cope with increasing diversity of students and staff
- Maintenance of high quality and national and global competitiveness and ranking
    - Quality of learning experience
    - Quality of social and support experience
    - Research quality
    - Academic staff quality
    - Support systems and staff quality
- Collegiate and inclusive approaches to decision-making and developments
- Increasing interdisciplinary and cross disciplinary education and research, and the creation of centres to facilitate this trend
- Continuation of the emphasis on a residential, campus-based University, but one also open to the development of new teaching and learning methods and approaches
- Closer partnership with businesses, including on-site integration
- Community links, and local and regional collaboration

Main drivers

The main broad drivers for the development of a new information strategy for the University might be:

Changes in education:

- The key trend is the globalisation of HE. This defines the competitive environment and demands information and communication systems which can both function effectively in this context and also help attract staff, students and new business. Because universities are powerhouses of the knowledge economy, there are growing opportunities for those with the right products appropriately presented.
- Changing education in terms of methods of delivery, working and interaction

Changes in technology:

- The digitisation of work and information. There continues to be a massive increase in data and information being produced (in all relevant areas: academic, knowledge, management, and administrative) associated with a need for staff and students to access, store, manipulate and disseminate new information easily and with low transactions costs.
- The changing knowledge and information management context.

Changes in people:

- Changing and more diverse people in use of technology, their requirements and expectations from education, and their requirements of technology used within education.

The main local drivers arising from the University of York's chosen strategy and Corporate Plan are:

- Growth, and the associated need to ensure during the process, the
    - maintenance of quality
    - maintenance of existing ethos and culture
    - maintenance of effective management systems
- The need for agility, flexibility and responsiveness to needs
- The requirement to form effective partnerships

4.   Current Systems and Competitive position

University of York

Our development of new information systems and services has been judicious and cautious; generally these have been well-managed with sound governance, but slow in development and in responding to need. There has been a strategic focus, and few failures in either delivery or adherence to budget. However there has also been little flexibility or resource to respond to additional needs, generating a waiting list for developments. With little space or time contingency, developments have rarely been innovative. Programmes of new developments are in train, but these often lag behind the sector.

The YIMS Programme has delivered a solid foundation for the University's critical business systems. Our web presence is adrift of the standards set by some of our major competitors but major developments are taking place in exploiting newer web technologies with the implementation of a Web content management system (CMS) and plans for a portal which will bring together access to a diverse range of information, services, and tools. Nonetheless, much remains to be done. Investment has not always been sufficient to satisfy user needs or maximise the full potential of the systems purchased and the ability of some areas to opt-out of corporate systems damages communication, community and identity. Work is being undertaken to integrate data from different business systems to provide new perspectives on activities, but there is a backlog of developments to be undertaken.

Our approach to collective learning systems (through the VLE) has been innovative and stimulating, but with a phased approach to roll-out to set standards uptake is still patchy though there is enthusiasm for further exploitation. Central services struggle to keep up with implementing the range of developments and enhancements sought by students and staff through lack of either capability or capacity. Our library and information resources have gaps in comparison to world class provision, and the learning spaces available are falling behind those of competitors in quality and variety. We have recently invested in digital library development, but demand for the digitisation of materials outstrips our capacity to deliver.

In the last National Student Survey (NSS) a pleasing 91% of undergraduate students reported their satisfaction with access to general IT resources, and all our student accommodation is networked. However, our IT infrastructure, though robust and reliable, does not provide all the facilities expected in a £200M turnover organisation. The current devolved model of provision in some departments is beginning to cause problems in inter-working at a time when inter-disciplinary work is growing in importance, and this is exacerbated when external collaboration is required with organisations using *de facto* standards.

The Competition

Not all the developments in which our competitors have engaged are relevant to the University of York, but all are making significant and increasing investments in information systems and services, usually in a planned and organised manner in pursuit of growth or excellence. Many of these developments have required a step change in the level of investment in the information systems and services area, a coherent approach to information management throughout the institution, and a recognition that innovation needs to occur at the speed at which the business requires it.

To provide a few examples:

Bristol's Institute for Learning Research and Technology continues to provide a stream of innovations for the benefit of the business; Cambridge is building a range of academic digital repositories through collaboration between the Library and Computing services; Cardiff is in the process of delivering a Modern IT Working Environment programme and the development of an advanced research computing service; Durham plan to invest in a Library extension including improvement of space for law and music; Edinburgh has a strong reputation in digital curation of academic databases, enhancing academic reputation and commercial exploitation, and like Glasgow is investing in substantial library refurbishment to provide technology rich learning spaces; McMaster have a Web 2.0 training programme for university staff and are implementing a "digital sandbox" for campus wide service development; Nottingham has a cross-service approach to information systems and services providing single portals for student and staff use; Oxford has a mass digitisation programme in association with other leading world Universities to transform the availability of historic text; St Andrew's is investing £30m in a library extension and redevelopment of existing space; Southampton is a leading exemplar of the provision of academic repositories and associated submission processes; Sheffield and Warwick have invested in new information commons buildings to modernise their library and IT support and create new types of learning space; Stanford is making teaching and other material available for downloading through iTunes; Yale now has a suite of twenty digital libraries to enhance its teaching and research and further project its reputation worldwide.

5.   Information Need

The Student

Learning

Students want high quality, stimulating teaching and learning. Increasingly they want to tailor their learning, and have more choice in timing and methods of delivery, assessment and feedback. They continue to value contact with academic staff and formal lectures, seminars and tutorials, but they also want to communicate and work in teams with their peers in the virtual world. They want to submit work securely and monitor their academic progress electronically, with all marks and feedback collected in one place. Many now use social networking tools before coming to University, and want to use these as well as their own consumer technologies and systems to engage with learning. Students want good simple access from a variety of locations to online collective learning systems, with a single source to manage their individual learning. They still desire a good library service using the appropriate format and making things available when and where they need them; print resources are still very much alive in many subject areas. They want real space for group work and social interaction, and creative space. Students with different backgrounds require different levels of training in information literacy, but all need new skills to critically appraise and make best use of the specialised resources and services available within the University.

Support

Students want insightful support and guidance during their studies, and a more joined up approach to administration and support. They would prefer a one-stop shop approach, incorporating both physical and virtual dimensions, in contrast to the scatter of existing services. This should be student-focused with professional delivery and seamless transfer to the right service, and offering an online booking system for the full range of academic, support and social activities.

Alumni and Life Long Learning

Students may now wish to engage with the University throughout their career, and take up opportunities for CPD and LLL which arise. There is an opportunity to maintain contact and a relationship with alumni through the offer of information resources and services. Alumni may wish to use communication and social networking services to keep in touch with each other and develop business contacts. The University will need to maintain information on alumni's achievements and interests, and build and maintain communities of common interests through virtual environments.

The Academic

Researching

Research varies between disciplines, but much now requires more contact and simpler communication with other researchers and access to data or information resources in a variety of forms. Large volumes of data storage and high performance computing are required for some; to others improved traditional research collections available via the Library are of paramount importance. Increasingly resources are sought in digital form available to the desktop instantly on demand, and waiting for or travelling to access resources is becoming unacceptable to many. Researchers in the Arts and Humanities are seeking to develop digital repositories for facilitating research on important collections.

Many researchers want easy access to and communication with colleagues in other departments or institutions for collaborative or inter-disciplinary research. Mechanisms and tools to work with others online through virtual research environments are developing. Specific new methods sought include simple videoconferencing, visualisation, instant messaging, joint document management and Web 2.0 publishing tools. Data and tools for more effective management of research projects and its outputs are required. The precise future of scholarly communication is not yet clear, but simple mechanisms for depositing research output into either local, national or subject repositories are needed. Accessible data storage is becoming a requirement for the results of sponsored research, and effective solutions for data storage and curation will need to be developed and offered locally. Routes for dissemination and promotion of outputs via the Web are required.

Teaching

Teaching is becoming more challenging as both the volume of knowledge required expands and the demand from students for more personalised teaching and support increases. The introduction of virtual learning environments and other collective learning methods offer a means of enhancing teaching and learning, but require significant investment in training, support staff, tools and production and delivery systems. Systems are required for recording and delivering existing styles of teaching as well as for the creation of new materials and offering of new methods of learning. These new methods often require appropriate physical investment in learning spaces and infrastructure as well as in virtual services.

Use of new technology for teaching and learning requires deeper understanding of pedagogy and potentially different skills. Teaching staff require education and training in these new opportunities as well as the motivation to engage. Some academic staff remain naïve users of technology and they require more basic support and instruction.

Library support for teaching needs to extend beyond the traditional reading list concept to embedding resources in all formats directly into online teaching materials. It also needs to source and support a range of repositories of different media to feed these demands and ensure legal requirements are met. New teaching materials themselves require management and storage in a way that encourages re-use.

The Staff

Staff want to contribute and input data into systems in a simple way, without multiple points of access but with appropriate security. They need to be able to combine reliable data from a number of sources easily for useful outputs, and want to be able to communicate with others inside and outside the University without unnecessary barriers or complexity. Good systems and clear policies for documents and records management are required, and collaborative tools for meetings, projects and scheduling. Staff want to be able to use a variety of mobile and portable devices in conjunction with University systems. Finished products are sought which are fit for purpose and can be easily integrated with existing systems. All require training and support to be readily available to make best use of the systems provided. Staff want to be capable and motivated to make the best use of the information systems available to them.

The Business Partner

Businesses and other partners seek the ability to work alongside the University. The University should orient its offerings in a way that matches their needs, in order to become their information service provider of choice. A first step is to see and understand what the University can offer, and the opportunity to explore this further in depth. This suggests a clear web presence with detailed information on the subject matter expertise of academic staff together with other capabilities. Partners, whether located on site or not, may wish to buy in to University information systems and services in a flexible and tailored way depending on their requirements. University services must be ready to broker and deliver the tools needed to achieve this vision of seamless interaction, and to help encourage business and community links.

The Visitor

The University needs to provide a good service for conference, short course, and CPD visitors. This applies to visitors in a virtual as well as a physical sense. Visitors will require access to information presented in an engaging way without the barriers or inhibitions which currently apply to their transient status.

6.   Future Systems & Services

This is the range of systems and services that will need to be put in place to fulfil the needs identified in the previous section. Some of these will be whole University systems, tested fully and rigorously; however part of the solution will be the agility to experiment and adapt to changing circumstances and technologies as they develop. There will therefore be a need for facilities to experiment, and contingency for the unexpected.

This section highlights those systems which might support the ability of the University to operate at a world class level, which will sustain its key processes, and which should keep it competitive. Not every system needs to be world class in itself, but collectively they should create an environment that meets this test.

The technologies will only work if accompanied by human understanding and engagement with the systems and processes. Managing the cultural and social dimensions of information systems will be crucial to success.

The Computing Service and campus infrastructure

- A single common pervasive network
- A single identity management system for access
- A single asset management system for device management including software delivery
- Adoption of de facto standards to increase agility and inter-working outside the University
- A solid core of reliable and sustainable systems
- The opportunity to experiment
- The responsiveness, capacity and ability to integrate new demands and services
- The capability to manage the full range of modern media, as digital information resides in a variety of physical formats
- Interoperability of all systems

The Library and learning spaces

- World class standards of information content in sciences, social sciences and humanities suitable for research and applicable to teaching
- Capability to embed content into learning packages and programmes
- Digital information resources through either purchase or in-house production
- A range of repositories and processes for collection of academic content, and enhancing York's reputation internationally
- A virtual library platform to provide access to all resources and services
- Discovery tools for the complete range of resources
- Learning spaces to meet all types of educational methods in use, through the development of existing space and expansion into the adjacent building
- Information literacy provision for all levels and user groups
- Effective communication systems and processes with stakeholder groups

Academic systems and services

- Further development of the virtual learning environment, with the incorporation of a range of collaborative tools, the ability to capture and store any teaching, and e-assessment capability
- Bespoke non-standard solutions and specific specialist software applications for individual departments
- A student portal for managing personal learning and development
- A virtual research environment allowing wide collaboration
- High end computing and large scale data storage capability
- A research management system
- Videoconferencing and virtual networking capability
- A range of Web 2.0 capabilities for teaching and research

Communication & business systems

- Excellent basic personal communication and organisation systems, including capability of working with a range of portable and remote devices
- A staff portal for managing work and with tools for fostering community
- The capability of combining data simply and meaningfully from the range of administrative systems
- Full lifecycle approach to student data gathering; from application to alumnus including assessments
- A joined up student support service offering online booking and services
- An excellent web presence for the outside world, increasing the success of reputation and brand, and with e-commerce capability
- A customer relationship management system, including alumni services
- A robust, flexible and easy to use records management system, incorporating Freedom of Information requirements
- An offering of information systems and services tailored for business partners

People and culture

- Clarity of ownership of information, particularly that newly created
- Full understanding and proper handling of information owned by others, including that licensed for University use
- Effective handling of confidential information and data security processes
- A University wide approach to information management, with more joined up working between library, computing and web services
- A programme to create competent users and develop information literacy for use of all systems and services
- A "sandbox", providing opportunity and encouragement for experiment
- Dedicated project management to oversee new projects through, particularly those calling for collaboration across services and departments

7.   Benefits & Measurement

The overall aim of the information systems and services in the University of York is to create an information environment that supports, facilitates and enhances the teaching, research, business and community activities of a world class University.

Information systems and services in this World Class University should therefore help to:

- Attract and retain the best staff, students, businesses and other partners
- Permit and encourage students, staff and partners to perform at the highest level possible
- Assist in encouraging agility and responsiveness to stakeholder needs
- Enable the University to be a good partner
- Sell the University's brand positively and consistently, both externally and internally
- Enhance the staff and student experience by delivering content and services in an professional, accessible and engaging way
- Develop the capabilities of individuals
- Achieve business processes and service standards which are competitive with other World Class institutions
- Provide an academic and financial return on the investment made in them

Following acceptance of the strategy, specific outcomes and associated detailed measures or benefit assessments will be developed for the strategic themes and individual implementation projects, linked to achievement of the corporate plan.

8.   Summary and Conclusion

The proposed strategy will require a step change in the investment level for information systems, services and management.

The next step, following acceptance of the main findings of this exercise, will be to develop a prioritised costed plan. This will be incorporated into a new expression of the University's Information Strategy.

The key priority themes of the strategy for the University of York to maintain and develop its world class nature and status would seem to be:

1. **Communication, collaboration and culture**: to provide and maintain effective mechanisms for facilitating these for both academic and general activity, internally and externally
2. **Content**: to provide information content in an effective and organised way for manipulation and use
3. **Core infrastructure**: provision of a solid reliable core of services, and expansion of this in line with the University's growth, with the capacity for agility and experiment
4. **Integration, efficiency and interoperability**: a strand which underpins the others above to ensure all work together effectively and are used to full advantage

Programmes consisting of portfolios of projects could be developed under these headings, to focus the overall strategy on outcomes consistent with the University's future vision.

Appendix A: Membership of the Working Group

Professor Trevor Sheldon (Chair)	Deputy Vice-Chancellor
Ms Anne-Marie Canning	President of the Students' Union
Dr Robert Demaine	Computing Service
Ms Christine Ellwood	Library & Archives
Mr Tim Franklin	Strategic Systems Programme Manager
Mrs Teresa Gibbs / Mrs Sarah Starkey	Planning Office
Dr Jeremy Goldberg	History
Mrs Elizabeth Harbord	Library & Archives
Dr Mike Jinks	Director of the Computing Service
Ms Hilary Layton	Director of Communications
Mr Bill Mackintosh	Web Office
Mrs Kay Mills-Hicks	Computing Service
Dr Steve Smith	Electronics
Ms Tracey Stanley	Library & Archives
Professor Susan Stepney	Computer Science
Dr Dave Surtees	Computing Service
Ms Rana Tayara	President of the Graduate Students' Association
Ms Elizabeth Heaps / Mr Stephen Town	Director of Library & Archives
Dr Chris Webb	Library & Archives