

## IT Strategic Framework

### A. Preamble

1. This IT Strategic Framework was written during 1999 and describes the University's IT strategy at that time when progress towards the introduction of divisions had only just started. Since that time considerable progress has been made in determining how the IT Committee and strategy should be changed but the arrangements are not yet finalised. We are therefore circulating the IT strategy in its present form while realising that some parts are already out-of-date. We intend that the successor to the IT Committee (the Information and Communications Technology Committee)(ICTC) will issue in a year or so an updated strategy describing more explicitly the arrangements and responsibilities for IT in the new University structure. The framework has also been written on the assumption that, unless contradicted in this document, the content of the 1996 IT Strategy still stands.

### B. Introduction

2. The University's IT strategy was last reviewed in 1996. Since then the growth in the use of IT has been rapid. There are now some 20,000 computers connected to the University network (compared with 10,000 in 1996) and some 300 people employed as support staff (an increase of some 20% since 1996). The traffic on the network doubles every 12 months, and is set to saturate the current capacity within the next year. Oxford's direct expenditure on IT (excluding academic and research staff time) is of an order of magnitude of some £10M per annum.
3. The University's policies have supported, encouraged, and to some extent anticipated this growth; and some measures have made it possible, notably the installation of the network backbone itself. But the main driving force for growth outside the central services has come from departments, colleges, and individual members of the University. In this sense, perhaps more than in the narrower technical sense, the University's IT strategy has been 'distributed'. This is entirely proper. Recent major national initiatives provide ample illustration of the dangers of the alternative IT strategy of considering the introduction of IT in isolation, and concentrating too exclusively on technological issues. They also bring home the importance of defining a clear strategic framework within which to make decisions about the very considerable sums that are spent on IT (it should be noted in this context that it is estimated that HE institutions spend on average 4.7 per cent of their turnover on information technology<sup>1</sup>). At a time when Oxford is changing its system for allocating resources, its own IT strategy requires re-examination and revision, so as to describe the present arrangement and guide new developments. This document details the IT strategy as seen by the IT Committee in consultation with others. It fully realises that with the change in the administrative arrangements the responsibility for providing services will change in the near future.
4. There is now no part of the University in which IT is unknown or in which the general issues raised by its introduction and exploitation are not now familiar. The level of

<sup>1</sup> UCISA figures. Oxford's expenditure on IT is of the order of 3.6 per cent, similar to that of many other large universities.

enthusiasm and the pace of development will continue, understandably, to be uneven, although the new technology will play an increasingly important part in teaching, research, communication, publishing, and administration. It is rather less clear how Oxford should respond to the kind of wide-ranging changes that enable new technology to be exploited most effectively.

5. There is, nonetheless, a need to provide effective central support for the work of individuals and departments, through the maintenance of infrastructure, through the provision of networked information resources, through policies that ensure availability of well qualified support staff, and by making known new opportunities. There is considerable scope for sharing good practice (an example being the use of IT to support the organisation of teaching in Biological Sciences). If Oxford is to use its collective resources effectively, then it must try to eliminate wasteful duplication in the purchasing of equipment and software that could be shared, and that there is a reasonable degree of technical coherence. The existing mechanisms for achieving this are not well developed. Apart from its advisory role, the IT Committee's formal authority is limited to a veto on expenditure above a certain threshold (currently £250K). This ensures that plans for large-scale spending are subject to independent scrutiny, but the short timescale on which many decisions are made in response to external funding opportunities undermines its effectiveness. Moreover the move away from large central machines has the consequence that very few of the projects are above the threshold.
6. The changes in the University's governance will have a significant impact on the way in which resources are distributed. The academic divisions, individual departments, and Continuing Education will have budgets from which they will be expected to meet their particular needs, including their IT needs. It is important that they identify these in their IT strategies and take account of them in constructing their financial plans (this refers not only to academic IT needs but also to the costs of implementing the administrative IT strategies referred to in Section F below). In future, the ICT Committee is likely to exercise its function more through the oversight of divisional IT strategies and the IT elements of divisional plans than through the formal approval of infrequent single purchases. It will influence IT strategy by commenting on the strategic aspects of spending plans of the academic divisions, Continuing Education and service providers and by offering guidance to colleges on the coordination of their own IT strategies with the University's.
7. The University's IT strategy needs to be placed in the wider context of an overall Information Strategy. The governance changes, and in particular the creation of a new office of Pro-Vice-Chancellor with responsibilities spanning the library and IT sectors, should facilitate the development of such a wider strategy.
8. The University's general IT strategy should be:
  - (a) to encourage the various component parts of the collegiate university to develop their own IT strategies within the context of an overall university information and IT strategy, to look at the use of IT and expenditure on it as an integral part of their normal activities, to take proper account of the immediate and recurrent IT costs associated with large bids to outside bodies, and to make best use of new IT opportunities;

- (b) to keep these local IT strategies under regular scrutiny to ensure their overall coherence;
  - (c) to ensure that IT needs are taken into account in the distribution of resources including adequate provision for replacement;
  - (d) to provide infrastructure, funded centrally;
  - (e) to use Oxford's collective purchasing strength to obtain favourable terms for the procurement of equipment and software, to avoid unnecessary duplication of effort or equipment;
  - (f) to develop effective information systems, including administrative and management information systems;
  - (g) to provide central services, including training, where central provision is likely to be most effective;
  - (h) to regulate to ensure overall coherence, to encourage good practice, and to prevent misuse; and
  - (i) to ensure that the University provides a good working environment for IT support staff, with appropriate remuneration, training, and opportunities for career development.
9. Responsibility for implementation of the overall strategy is divided between the IT Committee, the Computing Services (OUCS), Management Information Services (MIS), the library service, and a number of other bodies. There is room for defining more explicitly the individual roles. But in broad terms,
- (a) the IT Committee is currently responsible for general policy, for providing strategic direction to OUCS, for monitoring the IT strategies of individual departments, faculties, and central services, and for advising the central bodies on the distribution and use of resources for information technology; in pursuance of these aims, it gathers data and monitors progress in the use of IT in teaching, learning and research, the delivery of networked information by libraries, and the provision of management information, in order to expedite these activities by analysing their cost-effectiveness, raising awareness and disseminating good practice; in technical matters, it acts on the advice of its technical secretary, the Director of OUCS, who draws on expertise throughout the University through the Technical Review Group;
  - (b) OUCS manages the University's IT infrastructure, provides core services, including some central servers, and provides training and support for the 'distributed environment';
  - (c) MIS is responsible for advising on the development of administrative and management information systems;
  - (d) The Library Services are responsible for selecting, delivering and supporting information services in support of the teaching, learning, research and administrative activities of the University, and of the wider scholarly community.

The Director of University Library Services is responsible to the Curators of the University Libraries for the overall management of automated library services for the University of Oxford as a single support operation. There are currently two major providers of support for automated library services, the Libraries Automation Service (LAS) and the Systems Section of the Bodleian Library, and these units are being brought together in the context of the developing of a more integrated library service under the Curators of the University Libraries.

10. As the University's new governance structures are introduced, there will be more delegation of responsibility for provision to divisions, departments and faculties. We anticipate that the key role of OUCS will be to provide a reliable network infrastructure, and of the ICT Committee to define a coherent IT strategy, in the context of an overall information strategy. Oxford's IT strategy should not only define a framework for regulation and resource allocation, but should challenge all parts of the University to understand and take advantage of the opportunities opened by new technology. While the ICT Committee's role should be primarily to give strategic direction rather than to allocate funds, it should have a budget to promote innovation.
11. Appendix I summarises this paper, and Appendix II collects together some specific objectives for the next three years that follow from the more general principles set out in this review. Appendix III sets out suggested guidelines for divisional/departmental IT strategies. Appendix IV describes the IT facilities and services that might be found in a 'typical' department or faculty and Appendix V those for a 'typical' college.

### C. Support for teaching and learning

12. The University's IT strategy is to encourage and enable the use of new technology wherever it adds real value to the traditional methods of teaching and learning. The University through the Educational Policy and Standards Committee supported by the ICT Committee will promote its effective use by building on the work of faculties and departments, and of the central services. The University also sees value in developing 'transferable skills' in the use of IT and notes the positive influence of subject reviews in giving a stimulus to take forward the educational uses of IT.
13. The University recognises that the introduction of IT in teaching and learning is unlikely to result in significant savings in the short-term: the primary aim of its policy is to add to the quality of the University's educational activities, rather than to promote the introduction of IT as an objective in its own right.
14. The University expects the impetus for new applications in undergraduate education to come from departments and faculties. In the sciences, departments already have a well-developed role in undergraduate teaching, and the exploitation of IT is a natural extension of normal laboratory-based teaching and the existing procedures for delivery, organisation, and examining need little fundamental revision. The main issues here are, for the University, the level of departmental resources, and, for the departments, the integration of IT-based teaching into traditional courses and the formulation of coherent IT strategies to manage departmental resources to support it. In Humanities faculties, where more of the relevant teaching is delivered in Colleges, the exploitation of IT in teaching and learning is limited by the lack of central IT facilities and the lower levels of IT Support. For all areas there is a need for subject specific software to be made available in all Colleges and OUCS is investigating cost effective ways of providing this. The University should encourage departments and faculties to see IT-based teaching as an integral part of their educational activities, rather than as a separate activity requiring a separate source of funding. While the ICT Committee will not be directly responsible for the distribution of most of the resources available for IT, it will be important that it has funds available to use non-recurrently to encourage innovation.
15. Some lecturers have employed IT very creatively and productively. In a few cases, departments have made concerted efforts to make effective use of IT in the teaching and support of teaching in their disciplines. Many of those active in this area, however, feel an acute sense of isolation, and lack of central or departmental support. The introduction of divisions and the development of their IT strategies will lead to more cooperation between similar faculties and departments and hence both decrease the sense of isolation and also provide for a better sharing of experience. The use of IT in teaching and learning is rather less well-developed in this University than in many. The following central services seek to play a part in actively promoting and assisting the effective use of IT in teaching and learning: the newly-established Humanities Computing Development Team (HCDDT), the Staff Development Unit, and the Library Services Directorate through its Associate Director (Staff Development, User Education and Learning). Their activities in this area are however not on the scale of those at many other universities. Moreover, the chief impediment to more effective use of IT in teaching is the lack of academic staff time. It is important, therefore, that divisions, faculties and departments take an active interest in the development of IT-based teaching methods, and, where they are considered desirable, ensure that proper

account is taken of the time and resources needed for the development of IT-based teaching materials.

16. OUCS will continue to provide support through (i) the Humanities Computing Development Team in the Humanities Computing Unit (HCU) and (ii) the provision of advice on sources of help available elsewhere in the University. In designing its courses to complement those run by faculties and departments, OUCS will ensure that all students have the opportunity to develop transferable IT skills, and will give priority to projects designed to address any shortcomings identified by subject reviews. It will also provide informal support through OxTALENT. (OxTALENT is an informal steering group that aims to raise awareness of the benefits of IT in enhancing Teaching and Learning, to promote interaction between individuals and groups already active in this field, and to stimulate the use of technology at all strata of the University: for further details, see <http://info.ox.ac.uk/oxtalent/index.html>.)
17. Other support for the use of IT in undergraduate teaching and learning comes from various sources. Particular attention is drawn to the following:
  - (a) The colleges provide general-purpose computing facilities for undergraduates, local networks, and access through them and the University's Janet connection to the Internet from central computing rooms and from individual student rooms; the University expects that all undergraduates have, through their colleges, access to e-mail facilities, adequate numbers of workstations, and generic software (such as word processors and spreadsheets); it further expects that where faculties and departments consider that undergraduates need to be able to use subject-specific software in colleges, this should be provided on central servers (OUCS is considering how to provide access to central servers for those units which do not have their own), and that colleges will provide mechanisms for access to such servers from college machines (including web browsers and terminal emulation programs); and it expects colleges themselves to monitor and ensure the adequacy of their provision for students; in particular, network outlets in all study rooms should be provided at least in all new buildings;
  - (b) The Library Services provide extensive materials in electronic form, as well as the means of access to such IT-based materials, and to vast quantities of external electronic resources, through public terminals in the libraries and, via the network, to students working in non-library locations, 24 hours a day. The Library Services also provide training for readers in the use of IT and electronic resources, some of it in cooperation with OUCS, and the new Associate Director, Staff Development, User Education and Liaison will organise and extend this work.
  - (c) The Department for Continuing Education through its Technology Assisted Lifelong Learning (TALL) programme produces online courses and would welcome proposals for further cooperation and sharing of expertise in this area. It also wishes consideration of whether their courses should be made available to members of the University under subsidised terms.
  - (d) The Educational Technology Resources Centre (ETRC), through its hire service, provides equipment (such as data-projectors) for use in lectures, particularly

where this is too little used or too expensive for individual faculties or departments to purchase.

18. The 1998 review of the ETRC left open its future management and reporting structures. It also made the point that there is no clear demarcation between its work and that of OUCS: this is likely to be even more true in future as educational and communications technologies converge. The ICT Committee will consider the most appropriate place for the ETRC in the future management of academic services in Oxford, and the best way to ensure cooperation and coordination with OUCS and other service providers.
19. The exploitation of IT in postgraduate education is the responsibility of departments and faculties. The Educational Policy and Standards Committee has the task of ensuring that all graduate students are given adequate instruction in the use of the technological resources available to them in their departments, their libraries, and outside of Oxford. In the sciences, this initial training is the responsibility of departments; in the Arts, it is provided by departmental IT staff in conjunction with the Humanities Computing Unit. Graduate students, particularly those engaged in research degrees, typically make intensive use of networked resources and IT applications in their work, and require higher levels of access and applications support than undergraduates. The colleges and departments are responsible for providing appropriate general purpose computing facilities for their graduate students, and network access from them and from individual student rooms.

#### D. **Support for research**

20. With the exception of certain key items of infrastructure (see Section G below), in the sciences and social sciences, departments are expected to ensure that all necessary IT services and support are provided from within their own resources. The role of the central services is
  - (a) to provide network connections with adequate capacity to allow the exploitation of research facilities within and outside Oxford;
  - (b) to draw attention to and assist in taking advantage of funding opportunities, to help in the purchase of computer equipment (by providing information and negotiating special terms), and to provide advice on compliance with the University's IT strategy;
  - (c) to offer training and support to departmental IT officers;
  - (d) to optimise provision of bibliographic and other datasets and electronic resources within the appropriate technical and legal context;
  - (e) to provide various other services on a fee-for-service basis for the benefit of departments who choose to use them.
21. In some cases, OUCS offers direct help in the organisation and support of inter-departmental services (for example, the Bioinformatics Unit). Other cooperative services (such as OSCAR) are organised through departmental consortia; here OUCS is responsible more narrowly for providing information about the service and about the conditions for access, as well as for housing it. Following the recommendations of its

1997 review, OUCS is developing and extending its support for departmental IT staff, and the purchasing operations of OUCS and the Central Purchasing Office are being more closely coordinated. One aim will be to bring together their various sources of information and advice in a comprehensive set of WWW pages, that will be frequently updated.

22. Applications of IT in research in the Humanities are increasing year by year in quantity and sophistication, and tend to demand high levels of application support rather than major investment in physical infrastructure. The University will continue to promote the development of subject-based resources and the provision of adequate levels of local IT support; specialised support for research in the Humanities will continue to be provided centrally through the Humanities Computing Unit, under the strategic direction of the Committee for Computing in the Arts (see <http://www.hcu.ox.ac.uk/> and <http://www.hcu.ox.ac.uk/chc/>).

#### E. **Support for libraries and museums**

23. Library Services have a primary responsibility to provide information resources in support of teaching, learning and research. To fulfil this responsibility the libraries are developing a hybrid library strategy in which paper and electronic information sources are being linked and offered to the user in a single coherent service. It is the policy of the Curators of the University Libraries that the electronic services should not be restricted to individual libraries but should be accessible from any workstation attached to the network. The development of a more integrated library service will assist in achieving these objectives. However, meeting the growing demand for information in electronic format often represents a substantial *additional* charge on library acquisitions budgets with only a minimal countervailing saving on printed material.
24. The libraries sector is seeking to collaborate with other agencies in the University who are also involved in the creation of digital content, especially in the Humanities, including the Humanities Computing Unit (see above) and individual departments or faculties. The sector also looks to the OUCS for collaboration and support on technical networking issues.
25. The Libraries Automation Service and the Bodleian Systems Section (BSS) (in the process of being brought together into a single management structure) provide and support a range of library IT applications, and the BSS maintains the network within the Bodleian and provides full user support. To provide effective IT within the libraries sector, closer collaboration needs to be established between LAS/BSS - which both support library-specific applications software throughout the University - and the local departmental, faculty and college IT support staff, who sometimes provide general workstation and network support in libraries outside the Bodleian. OUCS and LAS should jointly provide training for local IT support staff in how to support local library workstations and networks.
26. The Libraries Curators' strategy for the use of IT includes the following key elements:
  - (a) continued development of a library management system for cataloguing, acquisitions, circulation control, serials control and stack requests;
  - (b) creation and integration of electronic catalogues of all locally held material;

- (c) Expansion of access to databases and electronic journals both networked locally and also available from remote servers;
  - (d) addressing the issues of user authentication and database access and licensing with a view to optimising provision (perhaps through a single log-on);
  - (e) digitization of selected material in Oxford's library collections, for use both within and outside Oxford (a Mellon-funded scoping study has recently investigated ways of making major institutional advances in this important area);
  - (f) creation of user interfaces offering easy navigation among the resources available, with hypertext links from bibliographic databases and the Oxford Libraries Information Service (OLIS) to full text;
  - (g) use of the Web as a means of guidance and training in the use of information resources;
  - (h) collection and use of management information;
  - (i) identification of resource requirements for the achievement of all these objectives;
  - (j) participation in the scheme for the voluntary 'legal deposit' of electronic materials.
27. Libraries are not expected to provide general IT facilities (e.g. for e-mail correspondence) and should take whatever steps they feel are appropriate to ensure that library terminals are used only for library purposes.
28. Museums are an important part of the University, not only as a resource for teaching and research, but also as a public face of the University. The museums have a primary responsibility to provide information resources in support of teaching, learning, research (including the wider scholastic community) and the general public. To fulfil these responsibilities the museums need to develop a hybrid museums strategy in which electronic information sources are developed that serve their broad spectrum of users.
29. The Committee for the Museums and Scientific Collections' strategy for the use of IT includes the following key elements:
- (a) continue development of museums collections management system for documenting cataloguing, collection care, etc.;
  - (b) creation and integration of electronic catalogues of all locally held material;
  - (c) expansion of access to databases and electronic resources, the most detailed being stored locally, with a collections index based on the University's central accessible web server;
  - (d) digitization of material in Oxford's museums collections, for use both within and outside Oxford;

- (e) creation of user interfaces offering easy navigation among the resources available;
- (f) collection and use of management information;
- (g) identification of resource requirements for the achievement of all these objectives.

#### F. **Administration**

- 30. Management and administrative IT systems have a crucial role to play in the development of the University's IT strategy, and also its wider information strategy.
- 31. It is important that, before a major new management information system is introduced, (i) the project should begin with a thorough analysis of objectives involving the intended and potential users; and (ii) the introduction of new systems should be coupled with a comprehensive and open review of procedures in the relevant area. Potential users may include academic and administrative staff in other parts of the University, and in the colleges.
- 32. The University should now be more insistent that IT is actually used for administrative purposes. The widespread introduction of computers throughout the University and the availability and development of the network create the opportunities to carry out existing administrative tasks in a more efficient way and to develop more effective procedures. The central services, and in particular Management Information Services, have a leading role to play in this, but the University expects all departments and faculties to address the administrative use of IT in their IT strategies.
- 33. A new director of Management Information Services has recently taken up post. The duties and responsibilities which fall to this important post include, the direction and development of Management Information Services, input to the University's information strategy and IT strategy (in particular developing with the University's senior officers an information strategy for the work of the central academic/divisional and departmental administration over the next five to seven years), the provision of advice to senior officers of the University and college representatives about business processes and information systems which make the best use of new technology, and integrating these into a university-wide approach.
- 34. Some developments pose particular challenges in a collegiate university. One is the computerization of student records, where there is a need to standardize the format of records and to coordinate their use across the colleges and a wide range of academic and administrative departments. Another is in taking forward the General Board's proposals to put the *Examination Decrees and Regulations* on line where success will depend as much on changes in the way faculty boards record and distribute syllabus information as on the development of IT systems (faculty boards were consulted on such changes in Trinity Term 1994 and again in Hilary Term 1995, and in the light of these exercises they were asked to prepare course handbooks; the implications for the structure and method of publication of the Decrees have however not been systematically followed up).

35. In some areas MIS will itself take forward the management and development of information projects. It will develop the next phase of the OpenDoor payroll and personnel system, to include customised personnel facilities, and will improve the operation of the finance system in consultation with users. In other areas, MIS will provide the technical infrastructure and take the lead in planning projects which involve collaboration between a large number of bodies, including colleges. It will build on the success of the ADMIT admissions system and introduce a new student registration system. The new Director will have key role in addressing the organisational issues, and will help to work towards greater integration in the management systems employed in the University.
36. Elsewhere, MIS will provide advice and support for projects that it will not necessarily manage directly, in academic departments, colleges, and in other central services. Examples may include the development of space management tools in the Surveyor's Office, IT support for the Research Assessment Exercise, and, with OUCS, the improvement of data communication and access security provisions (e.g. firewalls and authentication services).
37. In the past, the effective exploitation of the network for the distribution of information within the University has been inhibited by the fact that significant numbers of individuals did not have convenient access. Given the scale of recent investment in infrastructure and other IT equipment, it is no longer reasonable to accept this constraint. Accordingly all parts of the University should increasingly make the assumption that IT is now sufficiently pervasive for email and the WWW to be used as the sole means for contacting individuals and for distributing routine information.

## **G. General Matters**

### *Infrastructure*

38. Effective exploitation of IT use is dependent on the IT infrastructure. These include departmental and college networks as well as the facilities provided by OUCS as part of its core services. The extent and design of networks in individual departments and colleges is not determined centrally, although OUCS provides technical advice. The University expects those responsible for existing (in particular refurbished) and new buildings to provide for the installation and maintenance of local networks in accordance with the following principles:
  - (a) all academic and administrative offices should have an active connection point per person;
  - (b) all laboratories should have a possible connection to the network;
  - (c) all students should have access to the network (if possible from their own rooms) so that, in particular, they can conveniently read electronic mail and access the Web and library services on a daily basis.

It is recognised that (c) will lead to increased use of the internet for non-academic purposes and so to increased costs. OUCS will continue to sample network traffic to determine its broad nature and the ICT Committee will keep this matter under review as the commercial and recreational uses of the internet develop. It will explore ways to

recover some of the cost of recreational use from users or to develop additional links to the Internet through commercial providers for non-academic traffic.

39. OUCS is responsible for the key items of University-wide infrastructure, in particular for:
- (a) the University Backbone network;
  - (b) connection of the University network to Janet;
  - (c) certain network services, for example, domain name service, email relay service, email POP and IMAP service, mailing list service, web service, web cache, network news service, network time service, Windows Internet name service, Dynamic Host Configuration Protocol service, dial-up service, various authentication services;
  - (d) certain major systems centrally installed and available, for example, the Hierarchical File Store, general-purpose Unix servers (Sable and Ermine), special printers.
  - (e) Further details of the core infrastructure and other services provided by OUCS can be seen at <http://www.oucs.ox.ac.uk/internal/OUCS-infrastructure.html>.
40. The University expects OUCS and others responsible for infrastructure to make clear statements about the level of service that is provided and to take appropriate steps (for example, through maintenance contracts) to achieve it. In particular, OUCS services will be:
- (a) pervasive throughout the University including the colleges;
  - (b) have clearly enunciated Service Level Definitions;
  - (c) in as much as it is possible, be transparent so that users need only minimal training in their use or need not even to be aware that they are using them;
  - (d) be available at all times: this is especially critical in the case of the backbone network.

### *Regulation*

41. The following proposals have been prepared by the IT Legal Issues Working Party, designed to clarify the legal framework within which Oxford's IT facilities and services are employed, and to minimise exposure to legal risks. They have been endorsed in principle by Council, and gradually being implemented.
- (a) The IT Committee should have the authority to make binding Rules relating to IT activity University-wide, rather than leaving it as at present to one of the central service units (like OUCS).
  - (b) The Working Group was conscious that, as University IT facilities are provided for bona fide purposes only, individuals should be made aware that they have no automatic right to use them for other purposes.

- (c) Council should endorse the principle that the University reserves the right to examine material on any University IT facility when it becomes necessary for the proper conduct of those facilities or to meet legal requirements. This right extends to privately-owned computers connected to the University network. This right may only be exercised in accordance with guidelines laid down and publicised by the IT Committee.
- (d) Other than in (c) above, all users of University IT facilities should regard material belonging to others as confidential (unless the context clearly implies otherwise).
- (e) Procedures should be put in place to ensure that dealing with offensive electronic material of any kind for legitimate (eg research) purposes has been formally authorised in advance.
- (f) The University should install a Firewall to prevent unauthorised servers (eg Web, email, ftp) being accessible from outside Oxford's own network, and the IT Committee should draw up criteria for such authorization.
- (g) The University should ensure that it has taken every precaution necessary to minimise liability for the actions of any third party connected to its Network.
- (h) The IT Committee should redraft the Rules for Computer Use (<http://info.ox.ac.uk/rules/rules.html>) to bring them more into line both with the Janet Acceptable Use Policy: ([http://info.ox.ac.uk/rules/janet\\_acceptable\\_use.html](http://info.ox.ac.uk/rules/janet_acceptable_use.html)) and with relevant draft or actual legislation.
- (i) The potential for the University to be involved in litigation associated with material accessible within the Oxford domain to which others took exception has been recognised. On balance, it was felt that allowing the creation of personal Web pages is valuable to the University community. However, it is recommended that clear guidelines for the creation of personal Web pages be drawn up and promulgated, for each (authorised) server on which the material may be mounted. Also, that procedures be set up to act quickly to remove offending material should threats of litigation arise directed at the University in relation to such material.

### *Resources*

- 42. In general, IT funding should be an integral part of the activities it supports and should be funded, by and large, through the proposed new mechanisms for devolving resource allocation. OUCS should continue to be funded centrally, at least as far as core services are concerned.
- 43. The overall IT strategy is based on a distributed model, in which equipment and support are provided in the most appropriate location. It is the responsibility of the ICT Committee to keep under review the balance between local and central provision. In general, its preference is for local provision unless it is clear that it would be more effective for Oxford as a whole to make central provision (even if this would be less convenient for some departments). Where some specialist application is discipline specific it may be more appropriate to locate a facility within a relevant department.

However, wherever departmental facilities are funded on the basis that they provide a general service, it should be a condition of the funding that (i) the service is included on the register maintained by OUCS and (ii) the terms on which the service is available should be agreed with the ICT Committee and advertised widely. (Examples might include the Physics Photographic Unit, the Engineering's CAD-CAM facility and OSCAR).

44. Most IT purchasing in the University is devolved. However, several measures are taken to ensure that the best value for money is obtained, including membership of regional universities purchasing consortia, OUCS operating a Shop for many commodity and personal computer items, substantial central investment in site licensed software, and the negotiation of other special deals as the opportunities arise. Nevertheless, there may well be scope for further exploiting Oxford's collective purchasing strength. The ICT Committee will consider how this may be achieved.

### *Organisation*

45. The ICT Committee will consider its position within the new governance structures. At this stage, it is envisaged that the committee will have a major role in (a) advising divisions and extra-divisional departments on the construction of IT strategies, to form part of their rolling plans, and (b) commenting on those IT strategies to the Planning and Resource Allocation Committee. It will be important for the committee to devise specific mechanisms, for example by using checklists. The integration of the strategic oversight of the telecommunications system into the remit of the ICT Committee will help to manage the process of convergence of voice and data technologies.

### *IT support staff*

46. As the use of IT has grown, the collegiate university has become increasingly reliant on its IT support staff, particularly those with exceptional levels of technical experience. If the University is to reap the benefit from its substantial investment in hardware and software, it must be able to attract and retain good quality IT support staff in a competitive market. As in other areas where the University recruits in competition with a better-resourced commercial world, Oxford must make every effort to ensure that the conditions of service for support staff offer attractions to compensate for salary levels that are determined by academic benchmarks. The 1997 review of OUCS encouraged the Staff Committee to continue its work on grade definitions, and to move towards the elimination of anomalies. Since then, the situation has become more serious, with some posts being advertised at salary levels that are manifestly uncompetitive even in comparison with equivalent posts in other universities. At the same time, the University and the colleges have been expanding the number of support posts in response to the general acceptance of the principle that the effective use of IT requires direct access to local support staff.
47. The Staff Committee has taken a number of useful steps (by, for example, adding five super-scale points to salary scales) to allow the special skills of IT staff (and others) to be reflected in their salaries, and to allow flexibility. But the existing system is not well understood. The 'Bett Report' and the proposed introduction of role analysis and grading offer the opportunity for a comprehensive review of grading criteria and salary scales for IT staff in the light of current problems of recruitment. The result of this should be well-understood and flexible direction to university departments, which will

also provide useful guidance to other bodies (mainly colleges) who are recruiting, sometimes in competition with the University itself. Recognising the importance of IT staff to the University, the ICT Committee will from time to time gather information on recruitment, retention and reward, as well as data on salary levels inside and outside Oxford, and will work with the Personnel Committee on these matters.

48. Following the 1997 review, OUCS has given greater emphasis to its role in providing technical support for IT staff. It is the University's policy to provide direct generic IT support to users through local IT staff, and to develop the role of the computing service in providing secondary and specialist support. OUCS maintains a register of IT support staff, has special access arrangements to its help desk, provides training directly through courses and the provision of learning materials, and indirectly by evaluating and providing information about courses available elsewhere. It is planning (subject to availability of funds) to initiate a graduate trainee scheme to enlarge the pool of well-trained professional support staff and is beginning to develop plans for creating an emergency service to maintain continuity of local support in cases of illness or sudden departure. Consideration should also be given to the possibility of giving IT support staff the opportunity to move between units to meet those units' needs and widen the individuals' experience as part of a more structured professional development programme. All units recruiting IT support staff should make adequate financial support and allow individuals sufficient time to meet their immediate training needs, and also to provide opportunities for them to obtain general training to help them develop their careers.

### *Training*

49. IT training is provided or arranged by a number of different bodies.
  - (a) Departments, faculties, and colleges provide training for undergraduate, post-graduate and other members of the University in the use of academic IT resources. In arts subjects, the Humanities Computing Unit runs courses, in some cases in collaboration with the Library Services.
  - (b) OUCS provides generic IT training for all members of the University. This is free or charged at a subsidised rate wherever it is provided routinely as part of Oxford's educational activities or to improve the effectiveness of its employees (although bespoke courses may be charged for at a higher rate). The Academic Staff Development Committee has responsibility for identifying the staff development needs of those teaching in the collegiate University; it will collaborate with OUCS to ensure that those needs are met.
  - (c) The library-based IT services (LAS and Bodleian Catalogue Support service), as well as individual librarians, routinely provide user education and training in support of the use of electronic information resources. The University Library Services has an Associate Director (Staff Development, User Education and Liaison), to coordinate and advance such a strategy.
  - (d) OUCS provides IT support staff training for departmental and college IT support staff for which it may need to impose a small charge: this has indirect benefits in terms of encouraging contact among IT support staff, as well as direct benefits in terms of staff development.

- (e) The Department of Continuing Education provides courses for the general public, which can also be used by members of the University where they are not covered by (b) or (d) above. These courses are normally longer in length than those offered by OUCS and have significantly higher fees (the Department for Continuing Education being expected to cover a substantial proportion of its costs out of fee income).

#### *Access*

- 50. There is an increasing need for information systems to be more accessible to students and staff with disabilities. Changes to the Disability Discrimination Act beginning in October 1999 and the new European Human Rights Legislation which comes into force in 2000, as well as funding council policies and government reports (e.g. Dearing), mean that it should be University policy to ensure that all information systems are inclusive and can be exploited by all members of the University.
- 51. Providers of the University's web pages should use services such as the Bobby Accessibility checker to check the usefulness of their sources for those with visual impairment and other visual difficulties such as dyslexia. Making web pages accessible is a two-fold process. First, web pages need to be written so that they are accessible: a useful set of tools (html validators and spell checkers) is available at the JISC funded project Disability Information Systems in Higher Education web site <http://www.disinhe.ac.uk>; guidelines for accessible web pages should be developed and made available for web pages providers at the University – some information is available at <http://www.disinhe.ac.uk>. Secondly, disabled users need appropriate software and hardware to access web pages. Consideration should be given to the provision of web browsers with speech output, screen enlargement software and large monitors. Consideration should also be given to providing alternatives such as audio and Braille for users with visual impairments.
- 52. Workstations should be able to be approached easily by those with mobility problems, including those in wheelchairs. Provision of height adjustable furniture (chairs and desks) should be considered. Adjustments to the computer itself may also help some disabled users.  
For example, Windows 95 onwards has a number of built-in accessibility features. Different input devices e.g. trackball mice, split keyboards may be useful for other users. Access to peripherals should also be considered.

## **Appendix I: Summary**

### **A. Preamble**

(a) The ICT Committee will issue an amended strategic framework in a year or so to take account of the operation of the divisional structure [para 1]

### **B. Introduction**

(b) The ICT Committee will take forward its responsibility for reviewing IT developments throughout the University primarily by defining an overall IT strategy for the University, and by commenting on the IT strategies and spending plans of divisions and departments. [para 6]

### **C. Support for teaching and learning**

(c) The ICT Committee and the Educational Policy and Standards Committee will encourage departments and faculties to see IT-based teaching as an integral part of their educational activities. [para 14]

(d) The ICT Committee and the Educational Policy and Standards Committee will encourage departments and faculties to take an active interest in the development of IT-based teaching methods. [paras 15, 19]

(e) The ICT Committee should have a budget to promote innovation. [paras 10, 14]

(f) OUCS, the Library Services, Humanities Computing Unit, Department for Continuing Education, and OxTALENT will continue to provide support for the use of IT in teaching and learning. [paras 12, 16, 17]

(g) The ICT Committee will encourage departments and faculties to assume that all undergraduates will have adequate access to basic IT facilities through their colleges, and that colleges will monitor their provision to ensure it remains adequate. [para 17]

(h) The ICT Committee will consider the most appropriate place for the ETRC in the management of academic services in Oxford. [para 18]

### **D. Support for research**

(i) Central services should provide network and other IT infrastructure, information on funding opportunities, training and support, and electronic resources, to support research. [para 20]

(j) OUCS and the Central Purchasing Office will work together to produce a comprehensive Web-based directory of IT purchasing information. [para 21]

(k) Specialised support for teaching and research in the humanities will continue to be provided centrally through the Humanities Computing Unit in OUCS. [para 22]

### **E. Support for libraries and museums**

(l) The library and museums sectors will continue to develop their electronic offerings, both in scope and in ease of use; they will endeavour to ensure they are equally accessible

throughout the University increasingly integrated with use of traditional materials, and with ever improved means of locating them. [paras 23-26]

## **F. Administration**

(m) The ICT Committee will work with Management Information Services to ensure that the introduction of all major new management information services throughout the University takes full account of University-wide needs. [para 31]

(n) MIS will take forward the management and development of information systems, by advancing major central systems, and also the ICT Committee by offering advice and support to other units in developing their information systems. [paras 32, 35]

(o) The ICT Committee will encourage the central administration and other relevant parts of the University henceforth to operate on the assumption that all staff and students can be reached effectively via electronic means (email and Web). [para 37]

## **G. General matters**

### *Infrastructure*

(p) The ICT Committee will communicate with Estates Committee and other relevant bodies to ensure that adequate provision is made in newly acquired or refurbished buildings for networking infrastructure. [para 38]

(q) OUCS will monitor Janet traffic periodically and bring to the attention of the ICT Committee if there is much usage which does not appear to be for bona fide University purposes. [para 38]

(r) OUCS and other bodies providing infrastructure will provide key services and where appropriate take all reasonable steps to guarantee its continuous availability. [para 40]

### *Resources*

(s) OUCS should continue to be funded centrally, at least for core services. [para 42]

(t) All departments providing general services should provide sufficient information about those services to enable a central register to be maintained by OUCS. [para 43]

(u) OUCS and the Central Purchasing Office should ensure that advantage is taken of Oxford's collective purchasing strength to secure favourable purchasing deals. [para 44]

(v) The ICT Committee and Telecommunications Manager will manage the process of convergence of voice and data technologies. [para 45]

### *IT support staff*

(w) The ICT Committee will work with Personnel Services, OUCS and other relevant bodies to ensure that the University provides a sound working environment for IT support staff. [para 46]

(x) The ICT Committee will work with the Personnel Committee to ensure that the outcome of the Bett Report results in a better understanding by departments and colleges of grading issues for IT support staff. [para 47]

(y) OUCS will ensure that it builds and maintains a register of IT support staff, which it will use to ensure they receive focused support and development opportunities. [para 48]

(z) OUCS will embark on a graduate trainee scheme, funding arrangements permitting. [para 48]

(aa) All units recruiting and employing IT support staff should make adequate arrangements for providing appropriate training and development opportunities. [para 48]

### *Training*

(ab) IT training should be offered by the Academic Staff Development Committee, OUCS, Libraries, departments, faculties and colleges as appropriate. [para 49]

### *Access*

(ac) Providers of web pages, hardware, software and workstations should make facilities accessible to staff and students with disabilities. [para 50]

## **Appendix II: Specific Objectives.**

The route forward can be more clearly defined by translating some of the general statements in this document into specific objectives of the University's IT strategy. These are not intended to be taken either as instructions or as commitments. Their purpose is simply to focus attention on the practical steps that need to be taken. In each case, the principal bodies responsible are identified in brackets. The list does not cover all the issues raised in the document.

- (a) The ICT Committee will develop mechanisms for keeping divisional, departmental, faculty, and central services IT strategies under review to ensure overall coherence. [ICT Committee.]
- (b) The Committee for Computing in the Arts should keep under review the balance between central and local support in the humanities. [CCA.]
- (c) All students and academic and administrative staff should have basic IT skills. [Individuals and those responsible for training.]
- (d) The University should continue to encourage, and support by supplementary funding, the exploitation of special initiatives such as JIF, JREI, and RSLP, to provide high quality information services for research. [Council.]
- (e) The Research Services Office, in consultation with the ICT Committee, will devise checklists to ensure that strategic IT questions are properly addressed in major grant applications [ICT Committee, Research Services].
- (f) Science divisions and departments in particular should work towards self-sufficiency in research provision and should aim to reduce the use of central computers such as Ermine for research. [Divisions, departments.]
- (g) The arrangements for procuring and providing advice on the purchase of equipment will be coordinated and streamlined. [OUCS and Central Purchasing.]
- (h) The University should ensure that all entitled library users have easy networked access to an appropriate range of resources in electronic form, that they receive the necessary training in the use of electronic information resources, and that all libraries in the university have the necessary infrastructure to support electronic access to both local and remote information resources.[Library and all relevant units]
- (i) A full re-evaluation of the finance system will be carried out under the direction of the Finance Division of the central administrative service. [Director of Finance/MIS]
- (j) MIS will take the lead in planning and introducing new systems to store student information, and to handle the flow and processing of student data, in collaboration with colleges, faculties, departments, and services. [MIS, colleges, faculties, departments, services.]
- (k) There will be increased integration in the management and administrative systems in the University. [MIS]

- (l) The Surveyor's Office will introduce new systems for space management, in collaboration with MIS divisions, and departments. [Surveyor's Office, MIS divisions, departments, services.]
- (m) The University will maintain and improve its network infrastructure as the basic prerequisite for all its other strategic objectives in the application of IT [OUCS].
- (n) Everyone using IT in their work should have convenient access to local IT support. [Divisions, faculties, departments, services, colleges.]
- (o) Every office, teaching room and study should have an active Ethernet outlet. Provision for this should be made in all major developments. [Divisions, faculties, departments, colleges, and the Surveyor's Office.]
- (p) Every senior member of the University should have ready access to a personal computer. [Divisions, faculties, departments, colleges.]
- (q) OUCS will extend its Network Management Scheme to provide emergency cover for local systems staff. [OUCS.]
- (r) There should be well-understood and flexible principles for the grading and remuneration of IT staff. [Personnel Committee, in collaboration with the ICT Committee.]
- (s) Systematic provision should be made for the initial and ongoing training of IT support staff. [OUCS, those recruiting support staff.]
- (t) OUCS will advance its plans to provide specialist technical support for IT staff throughout Oxford. [OUCS.]

### **Appendix III: Suggested guidelines for divisional/departmental IT strategies**

This paper sets out guidelines which have been developed by the IT Committee to assist divisions and/or departments when preparing IT Strategies.

The IT Committee believes that it may be valuable for each Division to develop an IT Strategy. These should doubtless be integrated with each Division's forward plans, and into which elements of the IT Strategy may be incorporated. Divisions may also wish to encourage their constituent departments or units to prepare IT strategies as a part of their forward planning. Accordingly, the IT Committee hopes that these guidelines may prove useful both at the Divisional level and departmental or unit level.

The following list indicates the items which units might wish to consider when drawing up IT Strategies.

1. Role and place of IT in the overall strategic plans of the division/department.
2. Use of IT in research.
3. Use of IT in teaching and learning.
4. Use of IT in administration.
5. Policies in relation to:
  - (a) conditions under which local IT facilities may be used;
  - (b) replacement and "cascading" of equipment;
  - (c) backup and archiving;
  - (d) security and privacy;
  - (e) software licensing.
6. Overall method(s) of funding IT equipment, facilities and services.
7. Infrastructure:
  - (a) networking;
  - (b) divisional, departmental and research group servers.
8. Hardware and software standards.
9. IT support staff:
  - (a) structure and reporting lines;
  - (b) numbers and responsibilities;
  - (c) interactions with other IT staff and training and development.

10. Goals and expectations in relation to IT skills and facilities.
11. Management, control, and planning of IT facilities.
12. Date and Authorship of current IT Strategy.

## **Appendix IV: Departmental IT Services and Facilities**

This Appendix describes the IT services and facilities which typical departments in Oxford might provide, particularly but not exclusively in the sciences. This is not directly an 'expectation' on the part of the University, nor perhaps on the part of students or other members at that department. At the time of writing (mid-1999), no department provides exactly these services and facilities. Some provide more, while others provide less. It is for each department to determine the most appropriate level for it to attain, given its particular circumstances, pressures on resources, student and staff expectations, etc, and in the light of the IT Strategic Framework of the University.

### **1. Networking Infrastructure**

The Department has connected every office and laboratory to Ethernet. It also has Ethernet outlets in seminar rooms and in its large lecture theatre. The department has an annexe at a distance of 300 yards, and this is also fully wired and connected to the main building over optical fibres installed in the University's duct network.

The Departmental network on the main site has four major distribution locations, which have recently been upgraded with Ethernet switches to reduce congestion. A small part of the network in the main building still uses 'thin-Ethernet' wiring, though this is to be replaced this Summer with a 10BaseT structured wiring system, in keeping with the rest of the department, operating at 10 Mbps. One research group spread over 3 laboratories has a 100Mbps fast Ethernet installed, for rapid exchange of data between experimental systems. All hubs and switches are covered by the OUCS Ethernet maintenance service.

### **2. Servers**

The Department runs four servers, one operating under Microsoft NT, two running under Unix and one under Novell Netware. These servers support various research groups, the teaching laboratories, and the administration, and also run the Department's Web and ftp servers.

The NT and Novell servers are supported by OUCS under its NSMS scheme. A 'health check' is performed on these systems every six months. The Department has given some consideration to using NSMS also to support the Unix servers, but the research groups involved presently prefer to undertake this work themselves, not least because they frequently make locally-dictated system changes; they also have significant Unix expertise in-house. There are currently 3 flavours of Unix supported in-house, including increasing use of Linux. There does not appear to be much prospect (or, indeed, need) to rationalise this at present, given the self-sufficiency of most research groups in direct support of their own IT systems, and their ability and willingness to maintain a high level of security on their systems.

Three of the research groups have high-performance Unix workstations for computationally-intensive work. In addition, the Department is a subscriber to the Oscar supercomputer. A few researchers also utilise national high-performance systems for their work, in some cases as part of multi-institutional collaborative projects.

All the servers but one in the Department are backed up automatically on a weekly basis using the OUCS HFS. In addition, many of the PCs also utilise the HFS. The only server not utilising the HFS has its own backup system which was established some years ago; it has

been decided to retain this arrangement despite the work involved, because of the volume of data and the need for rapid restoration in the event of failure. Another server has a local backup in addition to using the HFS, also for reasons of rapid restoration.

All server computers in the Department are carried on relevant hardware maintenance contracts.

Mounted on the servers are different ranges of software, dictated by the different needs of the various research groups and teaching labs. However, the licences are all arranged through the departmental IT staff (who in turn liaise with OUCS to ensure appropriate economies of scale are obtained).

### **3. Use of IT in Research**

All research groups make considerable use of IT in their research, and have done so for many years. This includes the collection of data from experiments, routine data analysis, computer modeling and simulation, preparation of papers and reports, and so on. Increasingly, use is made of the Department's Web site for the rapid dissemination of preliminary research findings. Increasingly, research methods are moving away from 'wet' experiments to computer-based experimentation, which increases the dependence on rapid communication with colleagues at other universities and laboratories in the UK and overseas. Some use has been made of videoconferencing, including use of Internet-based conferencing; usage is not great, but is expected to grow steadily.

All graduate students are assigned to one research group or another, and are given (or provide) IT support and services within that context. All graduate students (and junior research fellows) are strongly encouraged to take whatever courses are necessary to ensure they are proficient in all relevant aspects of IT use. The Department pays for any JRFs that wish to undertake the ECDL.

### **4. Computer Laboratories**

The Department has set up four teaching laboratories equipped with computers. Two are equipped with Pentium PCs running Windows95 (20 and 30 PCs), one with 15 PowerMacs, and one with 15 Sun workstations running Solaris.

One of the labs has its PCs connected to experimental equipment, using software acquired from another university and substantially modified in-house. The Unix workstations run visualisation software and support computationally-intensive teaching work. The Mac lab runs some multi-media teaching software acquired when the Department participated in a national software development project through the TLTP scheme. One PC lab and the Mac lab run some teaching software acquired through the CTI Centre for this subject, but predominantly use web-based systems developed in-house as well as some standard software packages like SAS.

All the computers in the 3 non-experimental labs are connected to the University network, and some formal use is made of material available elsewhere (though when this proves popular or a lecturer recommends it, copies of the relevant files and data are usually acquired and installed locally). These latter labs are used about 30% of the time for formal classes, but are open to use by students of the department on a casual basis at other times. They are open from 08:30 till 18:00 Monday to Friday. Students must log-in to the Novell or NT servers before they can make use of the computers, and all software is run from the servers.

All students are given compulsory training sessions at the start of the academic year in the use of the departmental systems, and are required to sign an undertaking to abide by the University and Departmental Rules for use of IT facilities.

Each computer room is connected to one of the servers, from which all software is run. Each computer is configured to run on start-up a menu of the facilities peculiar to that lab. Each is also set up to run virus-check software on all files introduced (by floppy or via the Internet). Each room (apart from the experimental one) has a lecturer's computer, with a video projector connected to it. Laser printers and other special peripherals in each room are attached to the servers (different configurations for each, as appropriate), and one PC and one Mac have scanners attached.

## **5. Support for IT in Teaching & Learning**

The lecture theatre is equipped with a video projection system, which will take PC, Mac or Unix computers, as well as videotape. Staff are encouraged to make use of the Web and/or Powerpoint in their lectures, and 40% do so regularly. Most of these place their lectures on their Web sites, to support student revision and those who have missed lectures.

65% of staff have Web sites which they have set up to augment lectures and other formal sessions. In most cases these include course outlines, bibliographies, research interests and papers, and links to other relevant sites worldwide.

Several staff are also interested and involved in using IT more directly in their teaching, and to support learning. A few were involved in a collaborative effort led by Bristol University in a TLTP initiative to develop some web-based material to teach a rather difficult part of one of their courses. A few others have been developing more interactive web-based learning material, using a variety of tools (including Macromedia Director at the top-end for some multimedia animations in one area). Significant interest in using WebCT is developing, and various staff have attended courses run by OUCS and seminars organised by OxTALENT, and have also discussed their needs with ETRC and the Humanities Computing Unit team.

One member of the Department's IT support staff (see below) has been given the particular responsibility of developing expertise in this area.

The IT support staff have also developed a proposal for a 'learning management system' based on the Web, which will enable the tracking of student progress across all students taking courses in the Department.

## **6. Personal Computers**

The Department ensures that all of its administrative and academic staff have a computer connected to the network. It coordinates purchases of all personal computers. It depreciates these over a 4-year period, and 'cascades' older computers to less demanding locations around the Department. This means that the more demanding systems can be upgraded/replaced every 2 years.

All departmental personal computers are maintained under the OUCS PC Maintenance Scheme.

The Department has endeavoured to standardise on Microsoft Office products where possible, and recommends use of StarOffice for Unix workers, in order to improve communication of documents around the Department.

Students are not allowed to plug their own computers into the Departmental network at all. Staff may do this under strictly controlled conditions (including agreeing to abide by the Rules for connection of computers to the network and to install virus protection software on their computers).

## 7. **Support Services**

The Department is well aware of the importance of effective support for the use of IT, both for its administrative functions and for its staff and students. It has had at least one full-time IT staff member for 25 years, and the numbers have gradually grown to the present contingent of 5 (in part by utilising research grants, in part by squeezing other budgets, and in part by turning laboratory technicians effectively into IT staff, and now by utilising some of the funds released when the Department opted out of the OUCS HelpDesk service).

For a number of years, IT staff were employed specifically by relevant research groups. A few years ago, the decision was taken to consolidate most IT staff into one group, to gain economies of scale, to improve sharing of IT staff where groups cannot afford one FTE, and to provide professional and career support for the IT staff. This unit is headed by the IT Manager, who reports to the Departmental IT Committee (and to the Administrator on a day-to-day basis). One research group still has a dedicated IT staff member, and numerous JRFs and other staff spend time undertaking relevant local IT support; these all liaise closely with the Departmental team.

This IT unit provides active management of all networking facilities and most servers, and endeavours to respond to all requests for help of all kinds from staff, JRFs and graduate students. They have created a fairly comprehensive set of Web pages describing the facilities, services and policies of the Department, linking them to OUCS and other Web pages which give technical information and advice. Included in the Web pages are detailed descriptions of the systems and software which are 'supported', with links to the equivalent OUCS pages. The Manager has designated certain specialities for each IT staff member (eg certain applications software), but there is considerable overlap. All can support PCs, Microsoft Office software and Unix; there is some support for Macs.

'Surgeries' for users needing help or advice are run for several hours each day. Requests for help are also accepted via email and telephone (a separate phone number is used for emergencies). Problems which cannot readily be resolved are discussed among the IT staff (in particular with the manager); any that are still unresolved are referred to OUCS HelpDesk by the relevant IT staff (all of whom have been registered with OUCS).

The IT unit is responsible for creating and maintaining the Departmental Web site, though responsibility for the pages for each research group is devolved.

The staff actively interact with IT staff in other departments and around the University, attend relevant IT Support Staff seminars, and draw from and contribute to the various technical mailing lists. The Department strongly supports their further training and development, and has set aside an annual budget for attending outside courses from time to time. The IT Manager attends the University IT Users' Group, and is an active member of OxCERT.

## 8. **Planning and Management**

The Department's IT facilities and services are overseen by a Departmental IT Committee appointed by the Head of Department. This committee acts as an advisory body to the IT Manager, and also sets policy and considers long-term strategic developments in Departmental IT. It reviews and advises the Head on the annual IT budget and any significant capital items, and endorses any changes to the Departmental Rules regarding IT. It has adopted the University Rules, which it ensures in any event are known by all users of University facilities, and has added its own Rules. It endeavours to cooperate fully with OxCERT and OUCS in pursuing possible breaches of the Rules or other matters to do with the security and use of the University's IT facilities. The committee is allocated a portion of the Department's recurrent equipment grant, which it in turn allocates against the various competing needs. It also advises on all IT-related non-recurrent equipment grant applications.

This committee is made up of 4 academics with particular interest in or knowledge of IT, 1 junior research fellow with IT understanding, the IT Manager and the Administrator. It is chaired by one of the academics, who is the Department's representative on the University IT Users' Group. It invites a senior representative of OUCS and occasional other outside service providers to attend from time to time when appropriate.

The IT Manager prepares a Termly report for this committee, covering significant activity over the past Term and plans for the next period, as well as indicators of activity (eg numbers using computer labs out of formal class times, requests for help), and a financial report.

This committee has also developed an IT Strategy, which has a rolling horizon of 3 years (this is reviewed each year). This takes into account the University's IT Strategy, and an appreciation of the rapidly changing volume and nature of demand for IT services and facilities.

## **Appendix V: College IT Services and Facilities**

This Appendix describes the IT services and facilities which typical colleges in Oxford provide. This is not directly an 'expectation' on the part of the University, nor perhaps on the part of students or other members at that college. Nor does this represent the 'ideal' provision. However, as more colleges provide at least this level of service, the remainder are likely to want to follow suit. This Appendix should therefore serve as a useful benchmark against which to assess their progress.

At the time of writing (mid-1999), no college provides exactly these services and facilities. Some provide more, while others provide less. It is for each college to determine the most appropriate level for it to reach, given its particular circumstances, pressures on resources, student and staff expectations, etc, and in the light of the IT Strategic Framework of the University.

### **1. Networking Infrastructure**

The College plans to connect every part of the College to Ethernet. Currently, the College network extends to all offices (for academic and college staff) in the main college site, as well as to key rooms such as the library, the computer rooms and its seminar rooms and lecture room. The network also extends to all student rooms in the main College site.

The College discussed the connection of its two largest student annexes with OUCS. As a result, one of them was connected as part of a University-funded project to extend the Backbone to take in significant other University and college locations. The second annexe was connected by duct and optical fibre installations funded by the college itself. The College has subsequently wired up 60% of the rooms in these annexes. It expects to complete this process next year.

The College has given careful consideration as to how to connect students at other, smaller sites, which are not in the path of the University Backbone. After discussions with OUCS, it has installed a radio-LAN connection to a medium-sized annexe, and is negotiating with ComTel about ISDN DataNet provision at its other 3 smaller annexes. It currently recommends that students in their own accommodation (10% of the total student numbers) use the University dial-up service.

Overall in the connected buildings, 85% of student rooms have an Ethernet outlet, representing 70% of the students.

The College network on the main site has three major distribution locations, which have recently been upgraded with Ethernet switches to improve overall throughput. All the Ethernet hubs and switches associated with the network are maintained under the OUCS Ethernet maintenance scheme.

### **2. Servers**

The College runs two servers operating under Novell Netware. One supports the administrative and other staff of the College. The other supports other general functions (computer rooms, library computers). These servers provide file storage and sharing and printing facilities.

The Novell servers are supported by OUCS under its NSMS scheme. This relieves College IT staff of this specialised task for which they were finding it hard to maintain currency. A “health check” is performed on these systems every six months.

The administrative server is backed up automatically on a daily basis using the OUCS HFS, and the other servers on a weekly basis.

Mounted on the servers is a range of software, which can be run from the computer room and library computers, as well as from staff computers, but not from student computers in their rooms. Included are the Microsoft Office suite, Corel Office suite, StarOffice suite, Vista eXceed and several other general-purpose packages for which the University has acquired site licences. In addition, a range of freeware and shareware is available (this can be accessed by student computers), including Netscape and Internet Explorer.

### **3. Computer Rooms**

The College has set up two computer rooms for student use, one for undergraduates, and one for graduates. These are always kept locked, but any student can apply for a key for which they must pay a deposit. Students are not given keys until they have attended a familiarisation session in the computer room, given by the College IT Officer. They are also issued with usernames and passwords to allow access to the student Novell network.

Each room is equipped with 10 PCs and 2 Macintosh computers. 2 of the PCs are 486 computers running Windows 3.1, while the rest are all Pentiums running Windows95. It is planned to upgrade the 2 Win3.1 computers to Pentiums running Windows NT later this year, with all others following the year after. All the computers are connected to the College network. 2 of the PCs have Linux installed as an alternative operating system to Windows.

Each room also has a laser printer for which a charge is levied (accounting is done through Netware), a dot-matrix printer (which is free), and a modest colour scanner.

### **4. Personal Computers**

The College has provided all of its administrative staff and officers with a PC connected to the College network. It depreciates these over a 4-year period, and ‘cascades’ older computers to less demanding locations around the College. This means that the more demanding systems can be upgraded/replaced every 2 years.

All College computers are maintained under the OUCS PC Maintenance Scheme, and staff and students are encouraged to register their computers under that scheme.

The College also provides grants to enable those of its fellows who work in College to purchase PCs; this is undertaken on a needs basis, with each case considered on its merits; on average, this amounts to 35% of the cost, with the fellows’ faculty providing 65%.

50% of students with a connection available have connected their own PCs. The college charges £25 per annum for each student connection. Each student connecting to the College network (and thence to the University network) is required to sign an undertaking that they will abide by the College and University Rules for computer use. Among other things, this empowers duly authorised College IT staff to examine the contents of the student PC, or disconnect it from the network, should there be evidence of abuse or other irregular activity.

The Conditions are modelled on those originally prepared by St John's College, and endorsed by the University's IT Committee.

## **5. Support Services**

The College is well aware of the importance of effective support for the use of IT, for its administrative functions and for its junior and senior members. Starting from a very modest provision 5 years ago, its contingent now comprises an IT manager, who has oversight of all College IT facilities and services, and to whom other staff report, a half-time assistant IT support officer, shared with another College, and several graduate students employed on a casual basis.

These staff provide active management of all facilities, and endeavour to respond to all requests for help of all kinds. They attempt to minimise the need for one-one help by creating a fairly comprehensive set of Web pages describing the facilities and services of the College, linking them to OUCS and other Web pages which give technical information and advice. Included in the Web pages are detailed descriptions of the systems and software which are 'supported', with links to the equivalent OUCS pages. Only the software on the servers, plus Windows, is supported, though the staff have some Mac and Linux expertise and will help where they can. They will also endeavour to give limited support for general-purpose applications software like SPSS (but that is stated as having clearly a lower priority).

The College IT staff also run training courses from time to time relating to College facilities (including the above 'induction' sessions), and actively promote use of the free OUCS training courses for staff and students and other college staff.

'Surgeries' for users needing help or advice are run for a couple of hours each day and evening (these are manned by the graduate students). Requests for help are also accepted via email and telephone (usually, only an answering service is provided, though a different number can be used for emergencies). Problems which cannot readily be resolved are discussed among the IT staff (in particular with the manager); any that are still unresolved are referred to OUCS HelpDesk by the IT manager or assistant (both of whom have been registered with OUCS). These two are also the contact points for the Ethernet maintenance and NSMS services, as well as for IT security matters.

These staff also support the College administrative and development office systems, which utilise packages from an external vendor. They also are responsible for the College Web site (running on the central Ermine system), which is designed in conjunction with the College development office.

The staff actively interact with IT staff in other colleges and around the University, attend relevant IT Support Staff seminars, and draw from and contribute to the various technical mailing lists. The College strongly supports their further training and development, and has set aside an annual budget for attending outside courses from time to time. The IT Manager attends the Colleges' IT Group and the College IT Officers' Forum.

## **6. Planning and Management**

College IT staff (full-time and casual) report to the College Bursar, through the IT Manager. The Bursar normally takes advice from a College IT Committee, or from its chair in situations requiring a rapid response. The Chair deputises for the Bursar in IT matters when necessary.

The College's IT facilities and services are overseen by a College IT Committee appointed by the Governing Body. This committee acts as an advisory body to the College Bursar, and also considers long-term strategic developments in College IT. It reviews and advises the Governing Body on the annual IT budget and any significant capital items, and endorses any changes to the College Rules regarding IT. It has adopted the University Rules, which it ensures in any event are known by all users of University facilities, and has added its own Rules. It endeavours to cooperate fully with the Proctors and with OUCS in pursuing possible breaches of the Rules or other matters to do with the security and use of the University's IT facilities.

This committee is made up of the Bursar, 3 Governing body fellows with particular interest in or knowledge of IT, 2 junior research fellows with IT understanding, an appointee each of the Junior and Middle common rooms, and the college IT Manager. It is chaired by one of the Governing Body fellows, who is known as the 'IT fellow', who is the College's representative on the Colleges' IT Group. The Chair also meets with several colleagues in equivalent positions at other colleges at least once a year to compare notes on an informal basis. The IT Manager prepares a Termly report to this committee, describing significant activity over the past Term and plans for the future, and giving an indication of workloads (eg use of computer rooms, numbers of requests for help).

The College IT Committee has developed an IT Strategy for the College, which has a rolling horizon of 3 years (this is reviewed each year). This takes into account the University's IT Strategy, and an appreciation of the rapidly changing volume and nature of demand for IT services and facilities. It also considers carefully the needs of students across the range of disciplines and the arrangements which departments make or expect for access to their facilities from within college, and seeks actively to reach an understanding about where the responsibilities of each party lie.

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