UNIVERSITY OF CAMBRIDGE

REPORT TO THE COUNCIL AND THE GENERAL BOARD OF THE

REVIEW OF IT INFRASTRUCTURE AND SUPPORT

October 2012

Contents

Overview

The panel consulted widely. It received 32 written responses, and engaged in and followed discussion on the web forum. It interviewed a large number of people, among them computer professionals, administrators and academics.

Throughout, members were struck both by the engagement and dedication of the computer officers they met and by the fact that, almost without exception, administrators and academics praised IT staff across the University for their commitment and professionalism. Nonetheless, the panel formed the view that the efforts of individuals alone are not sufficient to ensure a service of the quality to which Cambridge should aspire. The panel felt that we spend a great deal of money, more than most UK Universities, but the quality of our services is patchy and does not necessarily compare well with that of other institutions. The panel concluded that many users in Cambridge might benefit from improvements in the provision of systems and services; it was telling that more recently arrived staff and students were fastest to characterise provision as lacking facilities that they had previously experienced elsewhere. The distributed responsibility for service provision provides for innovative approaches, but contributes to the patchiness of services. Overall, the panel was not convinced that we get the best service we could for our investment.

In the view of the panel, many of these deficiencies are primarily structural. They stem from the divided provision of central services, from weaknesses in current governance arrangements, and from obstacles to staff mobility and training. The recommendations that follow seek to address these deficiencies, to provide stronger leadership that is directed to more user-oriented and strategic provision of services, and to make the most of the considerable strengths of the different central organisations, so that the University gets the best service possible from its IT spend.

This report has not been able to examine in depth every aspect of IT provision in the University. Most of the proposals here will require further work on the detail for a successful implementation. But the panel is convinced that the recommendations of this report set the right direction of travel for the University, and should be taken forward as soon as possible. Over time, the panel believes the proposed changes should enable the University to deliver services and systems commensurate with its standing, while providing an improved working environment and career structure for all IT staff.

Introduction

1. This Review has its roots in the establishment in 2010 by the Planning and Resources Committee of working groups on organisational and financial efficiency, of which a key recommendation was for a review of IT infrastructure and support. This recommendation was subsequently accepted by both the PRC and the Council.

2. The appointment of this Review Committee (hereafter "the panel") was announced by a Notice of the Council in June 2011 (*Reporter* 2010-11 p901) together with an invitation for any member of the University to submit comments. The formal Terms of Reference are at Annex 1.

3. The panel received evidence from many parties across the University, including written submissions from 32 institutions and individuals and further contributions made via an on-line forum. The Committee has taken oral evidence in a number of sessions during the academic year 2011-12. A full list of those who contributed is set out in Annexes 2 and 3.

4. The panel would like to thank those who submitted written evidence, and those who gave up their time to meet us to discuss their submissions or other views. Considerable time and effort was spent by many people, for which the panel is most grateful.

BACKGROUND TO THE REVIEW

History

5. The history of computing in the University is a long one, and it is not necessary to repeat it here. However, the report of the last major review of computing in the University, led by Professor Sir Peter Swinnerton-Dyer in 1993 (*Reporter* 1993-94 pp 97-142), rehearses some of the key features of the organisation of computing in the University and is useful background relevant to understanding some aspects of the present institutional landscape, in particular the role of the present University Computing Service.

6. The landscape has changed radically since 1993. To illustrate the point, in 1993 the University was just working up to the closure of the mainframe service, and the Granta Backbone Network was being installed; it was before the introduction of large-scale enterprise systems for the management of the University's finances, HR and Student records. The period since 1993 has seen a huge expansion and complete transformation in the way IT is used in research. The use of e-mail and the world-wide-web and the ubiquity of on-line services of all kinds have transformed the way we all obtain, share and process information.

7. Organisationally, a major development was the creation of the Management Information Services Division (MISD) in 1998-99 as part of the Unified Administrative Service (UAS). This part of the UAS has continued to grow since that time, in line with

the needs of the University for administrative computing and business information systems, and the lessons learned from the report by Professors Shattock and Finkelstein (*Reporter* 2001-02, pp153-208) on the difficulties encountered with the implementation of the CAPSA accounting system. This growth is reflected in the computing staff numbers set out in Annex 4.

8. The governance of information systems and technology in the University was last considered by the Council and the General Board in 2006-7 resulting in the merger of the then Information Technology Syndicate (ITS) with the informal Information Strategy Group (ISG) (*Reporter* 2006-7, p803). The review, which was partly driven by comments from internal auditors that the ISG should be a more formal body, and that the governance of this area could be improved, concluded that "the work of the ISG and ITS has converged." As a result, the Information Strategy and Services Syndicate (ISSS) was formally established in its present form. At the same time, the University concluded, on the recommendation of the Council and General Board, that there was no clear advantage at that time in a merger of the University Computing Service (UCS) and MISD, as had been suggested by Professor Shattock in the report on the implementation of CAPSA, on the grounds that the two bodies had distinct roles, and there were significant opportunity costs connected with a merger.

9. In the same review, the present governance arrangements (UCS reporting to ISSS; MISD reporting to the Registrary as part of the UAS, but also overseen by ISSS) were put in place. The Council and General Board commented that they were "confident that these organizational and accountability arrangements will be robust in the short term but they may wish to review them in the light of the experience of some years' operation." This is in effect that review.

Present structure

10. The essence of our present organisational structure comprises two large central organisations, the UCS and MISD which employ around 120 and 90 staff respectively. In addition, the University Library (UL), which includes the Centre for Applied Research in Educational Technologies (CARET), is a significant provider of IT services.

11. The UCS has a wide range of functions. On a University-wide basis it manages the backbone network, up to the points of presence for individual Departments and Institutions; it provides a central e-mail service; it maintains the central identity register, the Raven access control system and the Look-up service. It also develops and maintains a variety of services that are available to Departments such as web hosting, a content management system, and managed mail domain services. It provides desktop services, primarily for students, in the form of the Managed Cluster service and provides advice on computer maintenance to individuals. It also provides a video conferencing service and a streaming media web service, and co-ordinates some software purchases. It offers advice to Departments who wish to review their IT provision, but does not in general take responsibility for the delivery of services to the desks of individuals. The UCS is also the principal provider of IT training within

the University, offering a wide range of courses to both staff and students. Managerially, the UCS reports to the ISSS.

12. The overall purpose of the MISD is to provide business information services that underpin the critical management processes for research, teaching and administration. They work across the collegiate University in planning and delivering the Information Service requirements of the University, progressively improving business processes, capabilities and information solutions that meet business needs. MISD provide a secure managed desktop, based on Microsoft Windows and the Office suite to central administrators in the University and a number of other institutions (approximately 1200 users). MISD are responsible for the purchase, and/or development and provision of Enterprise Systems, those large information systems such as CUFS, CHRIS, CamSIS, which are critical to the management of the University, its statutory reporting requirements, and operation of key business processes.

13. MISD also delivers a range of smaller scale systems in support of the central administration and the Departments, either as stand-alone systems or as add-ons to one of the major systems. Electronic Document Management, the pFact grant costing tool, and on-line payslips are examples of such systems. As well as these functions, MISD offers expert support for institutions within the University tackling business process analysis and improvement. It also manages the University Card system and delivers CamTools, originally developed by CARET. MISD also provides guidance and direct support for websites (the main UAS site, admissions and Alumni, amongst others) supporting content management as well as design and other aspects. As part of the UAS, the MISD reports to the Registrary.

14. Oversight is provided by the ISSS, which is chaired by a senior academic as the Vice-Chancellor's Deputy, and has members appointed by the Council, the General Board, and the Colleges' Committee, as well as a student representative, and members elected by the officers of the UCS and the MISD. It is supported by an administrator from the Planning and Resource Allocation Office. The role of the ISSS, (*Ordinances,* 2011 p129), is to set an information strategy in support of the aims and objectives of the University and the Colleges, to promote its adoption, to review the information needs of the wider University, and to advise on priorities. It is also charged with the oversight of the direction and planning of the UCS and MISD, and to ensure good project management of major information systems and projects. The role of ISSS is discussed in more detail in section B, on Governance.

15. The Centre for Applied Research in Educational Technologies (CARET), which is formally part of the UL, is a small innovative team developing IT tools to support teaching and research. CamTools is one of their most widely used applications, but there are many others. The UL itself is a provider of IT systems and services to its users, providing desktop facilities and catalogues as well as archival space.

16. Notwithstanding the two large central organisations, overseen by the ISSS, the responsibility for, and (in most cases) the delivery of, most IT services to, Faculties, Departments and non-School Institutions remains with those Faculties/Departments and other institutions. This activity falls largely outside the oversight of the ISSS.

Scale of computing in Cambridge

17. The scale of computing in Cambridge is large. The UCS collates data about the network and its use across the entire University. The Granta Backbone Network consists of over 38km of duct network with 83km of multi-core optic cable running throughout the city. The GBN is expanding to serve new University buildings and to improve connectivity and resilience in other cases. There are over 160 institutional connections to the Cambridge University Data Network (CUDN) across colleges and University institutions, and over 1000 Lapwing wireless access points.

18. The networks support around 45,000 users, with the main University e-mail service, Hermes, delivering around 190 million messages per year. The identity management system has to handle around 11,000 new users each year, with a similar number of people departing.

Resources

19. Despite the devolved nature of computing provision in Cambridge, with much of the spend taking place in Departments, it is possible to estimate the total spend accurately enough for the purposes of this report.

20. The largest element of IT spend in Schools and Departments is on staff. Staff numbers are reported in the appendices to the Annual Budget of the Council (*Reporter* 2011-12, p656). The details are shown in Annex 4, table 1: the figures for 2012 are 225 FTE Academic-Related Computing staff in Schools, Faculties and Departments; 60 in the UAS, which includes MISD and 90 in Academic Services, including the UCS and CARET. This illustrates the scale of the overall operation, and the approximate distribution of effort between central organisations and departments. The exact figures need to be treated with some caution; the total staff of UCS or MISD is greater than would be suggested by these figures, mainly because they employ staff who are not in the “Academic Related computing” category. Likewise, the annual staff cost for Schools and Departments of £11.3M, excludes many Computer staff funded by grants.

21. Table 3 in Annex 4 sets out Chest budgets for UCS and MISD. In the case of the UCS, this does not give an accurate picture of the overall spend, as a substantial amount of their income comes not from the Chest directly, but from providing services on a cost recovery basis. As at 2010-11, the overall UCS expenditure was about £9M, with about £4M recovered in charges. The MISD figures show an annual spend of between £5M and £6M, fluctuating according to the expenditure on major software packages.

22. As well as staff, there are equipment costs in Schools and Departments, and other institutions. These costs are shown in Table 4 of Annex 4, and it can be see that the current annual spend is over £10M.

23. In total, therefore, taking together the spend of UCS and MISD, with the staff and non-staff costs in Schools, Departments and other institutions, the estimate of annual spend comes to just over £40M for 2010-11 (Table 5 of Annex 4). This figure is an underestimate for the reasons discussed above, and also excludes indirect and electricity costs. To put it in context, this figure is roughly equal to the Chest Budget of the largest School, Physical Sciences. It also represents some 5% of the University's total 2010-11 expenditure of £775.6M (*Reporter,* 2011-12, Special no.6, p3)

24. Table 1 in Annex 4 also illustrates how the investment in IT has evolved over the last decade. The first area of growth has been in departments, reflecting the increasing importance of IT across the full range of disciplines and the increasing demand for the services delivered by Faculties and Departments. The second area of growth has been in the UAS/MISD, presumably driven by the increasing importance of and investment in major enterprise systems.

25. Table 6 in Annex 4 shows a very notable trend for UCS, increasing its cost recovery for the provision of services.

Comparisons with other Universities

26. In a review such as this, which examines whether the University is making best use of its investment in IT, it is useful to benchmark both the spend and services in Cambridge against those of our competitors.

27. Like Cambridge, other UK universities do not in general publish figures for their total spend on IT. However the University and Colleges Information Systems Association (UCISA; www.ucisa.ac.uk) does publish summaries of its annual collection of statistics. The figures on spend for 2009/10, the most recent available, are given in terms of total IT spend per FTE student:

	Spend/£
Maximum	2,369
Upper quartile	823
Median	555
Lower quartile	468
Minimum	97

(Source: Higher Education Information Technology Statistics (HEITS) Summary for 2009/10; www.ucisa.ac.uk)

28. The figures for Cambridge discussed in paragraph 22 above, taken with a student FTE count for 2009/10 of 18,306 (University of Cambridge, Facts and Figures) give a total annual IT spend per FTE student of £1.7k. Clearly this is well within the upper

25% of respondents to the UCISA survey, but not quite the maximum. These figures need to be treated with some caution. First, estimates of total IT spend in universities are inherently uncertain because many institutions, like Cambridge, do not have a single, centrally managed IT budget, but have distributed management and control. Secondly, it is not known exactly which UK universities are included in the UCISA statistics, so it is not clear to what extent this is a comparison with other UK research intensive universities. Thirdly, the Cambridge figures largely exclude IT expenditure by Colleges, which elsewhere might be recorded centrally. Nevertheless it is clear that Cambridge is among the higher spending UK Universities on IT.

29. As well as comparing expenditure, it is of interest to compare levels of service with those of other leading institutions. An informal survey of some other Russell Group universities has been undertaken, asking whether they provided certain specific services (chosen from among those that had been discussed during the panel's deliberations).

30. The results are shown in Table 7 of Annex 4. They should be treated with a little caution as the level of service provision is sometimes more nuanced than indicated by the simple answers shown in the table. That said, it seems clear that Cambridge does lag in some areas. This supports the view of the panel that we need to look hard at whether we are getting the best possible service we could for our investment, and whether we should aspire to do better.

31. Finally, it is interesting to note developments in Oxford. The underlying organisation is quite similar to that in Cambridge. Much provision is devolved to departments and Colleges, and the central structure consists of three main organisations. The Oxford University Computing Service performs many of the roles of the UCS in Cambridge, while the Oxford Business Services and Projects organisation delivers business information systems in a way broadly similar to the way MISD operates here. Finally Oxford has the ICT Support Team, a relatively small unit that provides desktop computing and associated services to the Administration and Libraries. This of course is equivalent to a major role for Cambridge's MISD discussed in para 12.

32. The key recent development in Oxford, facing similar challenges to ourselves, is that it has been decided to merge the three organisations. There is a major programme, led by a Chief Information Officer (a new post) which will deliver a single new department of IT Services. There is also work on the associated committee structures and governance arrangements.

School reviews

33. An important part of the background to this review is the fact that some of the Schools within the University have recently been undertaking their own reviews of IT provision.

34. The School of the Physical Sciences undertook a review in 2010. The motivation was a sense that the School might not be making the best use of the skills of its staff or its resources.

35. The conclusions were:

- There were considerable differences between Departments as to how IT provision was organised.
- Funding came from a mix of Chest, general Departmental funds, and research grants, and there was cross-dependency between core and project related IT work, putting core services at risk in some cases from the inevitable fluctuations in grant funding.
- Doubts as to whether all departments had the management structures in place to ensure that the service was driven by user needs and the best use was made of the considerable skills of staff.
- A considerable amount of re-engineering of core provision in different departments, to varying standards. This was felt, along with the management issues raised above, probably to lead to some users having a service which was less good than it might be.
- User satisfaction was not systematically assessed, but most departments showed no evidence of widespread dissatisfaction.

36. In conclusion, the report led to the formation of an IT Committee and the appointment of two IT co-ordinators on a part time basis from among the senior Computer Officers in the School. Their work so far has mostly been on specific departmental problems, acting as expert advisers to Heads of Department.

37. The School of Arts and Humanities conducted a review more recently, following problems experienced by two Faculties. Problems identified included resources (both staff and finance), a need for better communications with the centre, and a need for a more uniform approach between Faculties in some specific areas, so as to avoid duplication, and simplify the provision of cover when staff take leave. Like Physical Sciences, the School of Arts and Humanities plan to appoint to an IT co-ordination role.

38. The School of the Biological Sciences is also reviewing its provision. The key driver is the sense that the departmentally organised system of IT support may not offer the best value as it lacks the necessary efficiencies and economies of scale. Two pilots for sourcing generic provision, or aspects of it, from elsewhere - with the Clinical School's Computing Service and with the University Computing Service – are on-going, with more Departments assessing the cost implications of contracting out elements of generic support. There are also concerns about the need for better co-ordinated arrangements for the backing-up and archiving of vital data.

39. The background to and findings of these three reviews are consistent with the analysis of this review.

DISCUSSION AND RECOMMENDATIONS

SECTION A - APPROACH AND PRINCIPLES

40. The panel's remit was "to make recommendations to the Council and the General Board for the governance, organisation, and strategic development of IT infrastructure and support across the University, excepting only that provision made by the Colleges." As regards the costs of IT, the panel interpreted this remit as being to make proposals that would ensure the University is getting the best possible value from its investment in IT, and not to develop a plan for reducing the cost, still less to drive cuts in staff. There is absolutely no intention that this review will lead to redundancies. The panel has also not considered the arrangements for the governance or provision of IT by the University Library.

41. This report does not therefore make specific recommendations about the right size of the annual budget for IT; rather it recommends arrangements and structures that, in the view of the panel, will lead to the right decisions being made about investments and budgets for the best provision of services to the University.

42. Similarly, the report does not advance specific recommendations on outsourcing, although this subject is included in the Terms of Reference. Submissions to the review expressed a variety of views on outsourcing, but several made the point that outsourcing needed to approached carefully, and with full awareness of the resources that the University would need to commit to ensure the contractors fully understood the needs of the institution. Outsourcing can also involve other issues, e.g. questions of security, in the case of the storage of data.

43. The panel developed some underlying principles, set out in paragraph 47, which have guided the detailed recommendations, and which should guide their implementation. It proposes that these should be accepted as underpinning everything the University does in IT, to be sure that we get from our systems what we need as a leading centre of teaching and research.

44. Although these principles should not be contentious, it is worth explaining some of the underlying thinking. Two of the principles below (A3 and A4) propose the introduction of minimum standards of service for staff and students. With the raising of student fees, and with increasing competition to attract the world's top academics, it is essential that the diversity and innovation which are inherent advantages of the Cambridge structure be underpinned by some clear minimum standards of service.

45. The levels of service needed to fulfil A3 and A4 should be revised and updated as technology develops. At the present time, these service levels might incorporate the following requirements:

Staff and all students should have:

i. a unique identifier and straightforward means of authentication for all services;

ii. direct access to a secure University–wide (i.e. including the Colleges) wireless network, with connection via eduroam, to allow for mobile working;
iii. a configurable web portal providing access to email, internet and relevant university information services;
iv. user-friendly, web-based services for research, teaching, and administration appropriate to their needs;
v. high-quality help-desk support.

Staff and PhD students should have in addition:

i. access to personal computing facilities and on-line services in a secure environment provided by either a supported desktop (see A3) or a network connection that, in combination with an appropriate personal computing device, can provide the same core services as a supported desktop;
ii. access to a reliable fully backed-up central file-store sufficient for all normal working needs;
iii. access to high performance computing, charged appropriately.

[The term 'desktop' is used in the generic sense to denote a display and input device giving access to a common set of personal computing functions (e.g. word processor, spreadsheet, mail client, etc.) plus browser access to university-wide information services.]

46. The delivery of the best IT services is a matter of having the right people with the right skills as much as having the right equipment, so the IT strategy needs to include the development and management of the University's IT staff.

47. Similarly, with the use of IT, and particularly high performance computing, being increasingly important across a wider range of disciplines, there will be a need to ensure that the increasing demand for computation is met in a way that minimises energy use. This consideration needs to be at the heart of the IT strategy itself, and not simply seen as the responsibility of some other part of the University.

Statement of Principles

A1. The aim of this Review has been to make proposals to help the University obtain the best value from its considerable investment in IT, not to cut costs. There is absolutely no intention that this review will lead to redundancies.

A2. As a leading University, in the UK and the world, we should expect the quality of our information services and systems to be commensurate with our standing.

A3. Every member of staff whose role requires access to information technology should have, at minimum, access to a desktop providing an appropriate level of service.

A4. Every student should have access to the computing facilities and network services necessary for their course.

A5. The University needs information systems that promote efficient and effective administration and support its statutory reporting requirements.

A6. The governance and organisation of information services and systems should be driven by a strategy that is based on a clear understanding of user needs. The strategy needs to respond to and exploit the opportunities provided by technological developments.

A7. In order to provide world-class information services and systems, high priority should be given to the support, development, and retention of talented and committed computing support staff. The University should provide these staff with high-quality career opportunities, and make the best use of their skills.

A8. In Cambridge's devolved structure, there should be space for innovation in service provision, and different Institutional needs should drive the design and delivery of the services that are provided. Schools and Institutions must accept joint responsibility with the University for delivering the minimum levels of service referred to in A3 and A4.

A9. The governance structure should ensure that the University's needs for information systems and services are met in a way that reduces carbon dioxide emissions as much as is practicable.

48. The rest of the report consists of discussions and recommendations in each of the key areas considered by the Review.

SECTION B - GOVERNANCE

49. The panel received a large amount of evidence relevant to the strategy for, and governance of, the University's IT provision. In many cases the points made described, for instance, the lack of, or quality of, a particular service. However the panel felt the underlying issue often concerned the strategic direction of the University's IT, and the way decisions were taken, as much as the specifics of the service or system in question.

50. On Enterprise and information systems, the panel formed views and took evidence on services that are not provided, either by one of the central organisations, or elsewhere. For example simple, user-oriented, systems for recruitment, claiming and payment of expenses, or room booking across the University either do not exist, or are weak. There is no system which can give Principal Investigators instant access to the up-to-date information they need to manage research grants. It is unsatisfactory that students were not able to access all the services they needed through one, easy-to-use web portal and that new students

cannot access Raven-protected services and information until they actually arrive, something which was said to compare badly with other Universities. The difficulties caused by the diversity of e-mail systems and the weakness of web search functionality across the University, were mentioned, as were the challenges for consistent branding caused by a variety of systems supporting websites. The organisation for the central purchasing of software licenses was another area that attracted some adverse comment, although the panel was pleased to see recent developments from the UCS which aim to address this, at least in respect of software for teaching and learning.

51. It was also far from clear that the prioritisation of investments in these systems was driven by a co-ordinated overview of the needs of users from all parts of the University, academic and administrative.

52. Moving to standard provision of machines and networks, there was adverse comment on the lack of easily available and large-scale file storage and back-up services which could meet the growing needs of Departments. Related to this, the actual standard of service provided to staff and students varies from department to department, and leads in some cases to a poor user experience. The departmentally focussed system of decision taking cannot ensure that there is a minimum standard of service, and also leads to additional expenditure on multiple small-scale implementations, with Departments duplicating work.

53. Departmental responsibility for IT provision means that it is difficult to steer the total IT spend across the University, but the lack of a single body with a clear oversight and control over the budgets of the central organisations makes it difficult to ensure that even the central spend is allocated to best effect.

54. As well as the duplication of work between Departments and Institutions, the panel saw a risk of duplication between UCS and MISD, as there were no clear dividing lines between their responsibilities. The most cited example was the way both organisations provide Content Management Systems for websites, but the duplication was symptomatic of a wider problem of a lack of strategic oversight of the priorities of the two organisations.

55. The UCS, in its submission to the panel, argued for a strengthening of the central strategic function. The UCS considered that the ISSS had produced a strategy with good high-level objectives, but did not have the levers required to implement it. In particular the UCS felt the ISSS was in an unclear position with respect to the work of MISD. Furthermore, the UCS submission argued that the remit of the ISSS should be extended to include not just the expenditure of MISD, but also that of CARET, the High Performance Computing Service (HPCS), and Schools and Departments.

56. Material from MISD made similar points about how the ISSS had struggled to operate strategically, and had become too involved in the detail of operational matters. The comment was made that the strategic review of the HR and Finance Systems was in fact driven from within the Unified Administrative Service, rather

than by ISSS. MISD argued that the ISSS should become a smaller body with a clearer focus on strategy, leaving the details of information systems to specific committees with the necessary expertise. The MISD submission also argued for a strengthening of School involvement in IT, so that the ISSS could include in its membership Heads of School and School IT leaders, as well as PVCs and central service providers.

Conclusions and Recommendations

57. The panel agreed that the present structure of ISSS is indeed badly flawed. First, it does not have clear budgetary control over the majority of the funding of UCS and MISD. This is a fundamental weakness in its ability to provide effective strategic direction. There is a need to create a body which has the ability both to develop the strategy and deliver it.

58. Secondly, the membership of ISSS is problematic. Its members representing the academic part of the University are not necessarily well placed to have a good strategic view of the needs of their Schools. This is a difficult problem to solve within the existing structure without dedicated support for them in their role of School IT representative. School-level IT structures would address this, although there would still be a weakness in as much as the membership of the ISSS only allows one person for every two Schools. It is unrealistic for one person, while maintaining their academic research and teaching activity, to represent in an effective way the detailed IT needs of two Schools. The panel also queried whether it was appropriate to have elected representatives of the staff of the service provider organisations on the ISSS. Conversely, the responsibilities of the Registrary, depend critically on many of the IT services provided, yet he is not a member and only has the right to attend.

59. Thirdly, the executive support for ISSS is limited. Its Secretary has numerous other responsibilities and has no executive authority over the central organisations. It is not surprising therefore that the ISSS struggles to exercise effective oversight of projects, without the critical expert resource needed to undertake detailed work on the provision of IT across the University.

60. As a result of this evidence, the panel concluded that the most important first step would be to reform the governance structure for Information Technology and Services across the University.

Recommendation B1
The Information Strategy and Services Syndicate should be replaced by a strengthened Information Services and Systems Committee (ISSC) which is better equipped to shape and drive the provision of high-quality information services and systems across the University.

61. The ISSC must have effective oversight of the main central service providers and have a membership that is made up of senior people who routinely handle high-level University business, similar to that of the Resource Management Committee. The members must have a high level understanding of the strategic IT needs of their

parts of the University. They must represent academic, non-academic, and collegiate parts of the University. The panel proposes the following membership structure:

The membership of the ISSC should include:

a) The Vice-Chancellor, or Deputy, as Chair;
b) Heads of Schools, Registrary, Librarian, the PVC for Education and the PVC for Research (as chair of the Research Computing sub-committee);
c) Two external members;
d) One Council representative;
e) One representative nominated by the Colleges' Committee;
f) One undergraduate and one post-graduate student representative.

The Vice-Chancellor's Deputy would be expected to be the Senior Pro-Vice-Chancellor. The Information Services and Systems Director (see Recommendation C1) would be in attendance. It would be expected that the external members would be chosen to provide expertise in the management of IT in other organisations.

62. The panel concluded that the duties of the ISSS also need reform. The main changes required are ones that will ensure that the new ISSC has the levers it needs over IT budgets. However, on information systems, where the oversight of MISD by the existing ISSS has hitherto been relatively limited, it is important to balance the ISSC's proposed new budgetary control over the provision of key information systems with a duty on the ISSC to ensure that those systems can deliver the administrative and management needs (including the statutory reporting requirements) of the University.

63. The other major change the panel proposes to the duties is that the ISSC should define minimum standards of service that should be delivered to all students and staff. As discussed above, a world-leading University should have such minimum standards set centrally, if it is to continue to have a highly devolved structure of decision taking about the organisation of provision. The duty of defining those standards clearly falls to the new ISSC.

64. In summary, the panel proposes that the ISSC should:

i. develop and implement a strategy for information services and systems across the University;
ii. report to both the Council and the General Board;
iii. hold budgetary authority for all centrally provided services;
iv. be responsible for ensuring that the University's information systems are fit for purpose and deliver the administrative and management needs of the University, taking due account of the needs of users, both centrally and in Schools and Institutions;
v. be responsible for setting minimum levels of service provision;
vi. be responsible for ensuring that all services and systems provide value for money;
vii. make and publish rules for the regulation and security of the use of information technology and systems within the University;

viii. publish an annual report and annually review the information services and systems strategy.

65. While the creation of the new ISSC is important, further changes are necessary. It will be important to ensure that the new ISSC has adequate executive support; it is proposed that there should be an Information Services and Systems Director who would lead the delivery of both the strategy and decisions of the ISSC, and the central service provision, including the proposed new Data Centre. It would also be expected that this person would lead the implementation of the reforms proposed in this report. This is set out in more detail in Recommendation C1.

66. As well as the central ISSC, there will need to be sub-committees to carry out much of the routine business of delivering the strategy. The panel does not wish to dictate to the new ISSC and the incoming Director exactly what the new structure should be, but it does have some suggestions. Recommendations B2 and G2 need to be read in the light of this paragraph.

67. One need will be for an operations sub-committee with much more direct responsibility for ensuring delivery of services, and which will take the lead in co-ordinating between Schools and Institutions. It will also be the key provider of technical advice to the ISSC, and work to promulgate good practice.

Recommendation B2
There should be an ISSC Operations Sub-committee that takes responsibility for the delivery and day-to-day operation of the University's information services and systems.

68. The precise terms of reference for this sub-committee will need to evolve as the recommendations in this report are implemented, but the panel would suggest that the Operations Sub-committee should:

i. provide technical advice to the ISSC;
ii. with Schools, ensure the delivery of the minimum levels of service provision defined by the ISSC;
iii. be responsible for co-ordinating the efficient delivery of information services and systems across the University;
iv. monitor the delivery of all centrally provided information services and systems including the core infrastructure, the telephone network, the major information systems and the provision of a centrally supported desktop service;
v. provide a focal point for sharing best practice and promoting its adoption across the University.

69. The membership of such a Sub-committee should include:

a) The Information Services and Systems Director (as Chair, see C1);
b) Schools' and Institutions' IT Co-ordinators, or representatives of the co-ordinators;

c) Managers of centrally provided services;
d) Representatives of the Colleges' IT support staff.

70. Research computing has distinct challenges, which are discussed in more detail in section G of this report. The panel felt that the strategic needs of the University for Research Computing require definition and oversight by a separate sub-committee of the ISSC.

71. It is also clear that there will be a continuing need for groups to cover the work presently handled by the Joint Networks Management Committee (with key membership from Colleges) and the groups overseeing developments of the major information systems, such as the Finance Systems Committee, the Student Systems Committee and the HR Systems Committee. It may be that the best solution, at least for the immediate future, is to retain these committees in their present form, and establish a reporting line to the ISSC.

SECTION C - CENTRAL STRUCTURES

72. The panel received a great deal of evidence about the perceived strengths and weaknesses of the central organisations.

73. The UCS was seen to have key strengths in the construction and deployment of effective and robust systems. The roll-out of the VOIP phone system was an example, as was Raven, although Raven was criticised by some for its lack of flexibility. The network, on which so much depends, simply works, and was something where any weaknesses would be instantly apparent to a large number of people. The provision of strategic advice to Departments and Institutions was also felt to be very effective.

74. The UCS provides a range of services that can be used or not as institutions choose. College IT Officers stressed the importance to their institutions of having this menu of UCS services, commenting that different Colleges tended to make very different selections of which services to buy in. Although the Colleges are formally outside the scope of this review, they made the point that they would be concerned if there were to be radical change to this system.

75. Other parts of the UCS service were not seen to be as strong. The organisation of software licensing and sales was felt to be an area where a better service could be provided. The panel is aware that the UCS is taking steps in this area. The panel also heard comments about a situation where an institution felt it could not obtain swift onsite practical help from UCS experts in a crisis that had escalated to a point where its swift resolution was beyond the capacity of the local staff.

76. The panel felt that the UCS culture, perhaps for understandable historical reasons, was too inclined towards constructing systems in house, rather than

purchasing industry standard solutions. It was also not clear how the priorities of users across the University translated into the priorities of the UCS. The UCS argued that its role was to take a considered view of the great variety of needs across the University, synthesise those needs, and develop services that reflected that synthesis. The panel felt this process lacked transparency.

77. Turning to MISD, it was notable that some academics had little awareness of its existence as a second central unit. As to the first of its roles, the provision of standard desktop computing services to the administration, MISD was seen as effective and competent in its delivery, although comment was made that the (scheduled) downtime of the Administrative Computing Network seemed higher than might be expected. The comment was also made that the MISD system for managing desktops seemed inflexible compared to the departmentally provided service, although it is not clear how widely this view is held.

78. There was discussion of the way that the major Enterprise systems were procured and managed. In comparison to UCS, the policy of MISD depended much more on the purchase of off the shelf systems. That of itself was not a problem; the issue was more that these systems were very much "owned" by the central UAS Divisions who were MISD's main customers, and one consequence of this was that the systems often seem unfriendly to academic users and departmental administrators who use them less frequently. These points are discussed later in the report, at section F.

79. The panel was also told that with the boundaries blurring between Information Services and Technology, service provision increasingly required a coherent technical architecture across systems and infrastructure. It followed that in this environment services are best delivered by an organisation with an overview of the user requirements and all the architecture issues.

Conclusions and Recommendations

80. The panel considered the evidence concerning the UCS and MISD, and whether the present structure was the right one to deliver a first-class service driven by the guiding principles set out at the start of this report.

81. It was clear that each organisation had considerable strengths, but there were areas where, looking at the two organisations together, they could deliver more effectively for the needs of the University. As well as the technical points mentioned above, the panel concluded that an organisation with a single leader would deliver other advantages.

82. First, a single organisation would be better placed to deliver a clearly user-focussed strategy developed by the new ISSC, to meet the needs of the University as a whole. Secondly, a single organisation would be able to eliminate duplication where it exists, freeing scarce resources for new services. Further, the panel felt that a single organisation would better support the need to provide an excellent

professional career structure for our IT staff with a variety of opportunities to develop and/or learn new skills. This need is discussed further in Section E. These considerations led the panel to the conclusion that the University should unite the two organisations under a single leader, reporting to the new governance committee.

Recommendation C1.
The University should appoint an Information Services and Systems Director.

83. The conclusions of the panel about the role of this individual were that the Information Services and Systems Director should:

a) report to the Registrary, who will act as the Director's line manager;
b) be accountable to the chair of the ISSC for the delivery of its strategy, plans and decisions;
c) lead the implementation of the reforms recommended in this report;
d) be responsible for, and manage, the budgets of centrally managed services and facilities within the framework set by the ISSC.

The individual appointed as Information Services and Systems Director should have wide experience of managing IT in large organisations, understand the devolved nature of decision taking in Cambridge, and be able to engage with the culture of a research-intensive university.

Recommendation C2.
The UCS and MISD should be merged into a single organisation under the leadership of the new Director as soon as possible. The ISSC should examine whether other central service providers should also migrate to the new organisation.

84. While the detailed organisational structure of this new and expanded university computing service should be a matter for the Information Services and Systems Director to determine, subject to the approval of the ISSC, the panel is clear that the first Director should be mandated to create such an expanded, and fully integrated, computer services organisation.

85. The convergence programme must involve staff in affected organisations, and ensure that new structures work to make the best use of the skills of our staff, and provide the best possible training and career development opportunities. The panel also notes that the current UCS will shortly need to vacate its present premises and suggests that those parts of the current MISD and UCS that deliver related services should be co-located as quickly as possible.

86. The panel also recommends that the new organisation should be outside the Unified Administrative Service, although the Director should be line-managed by the Registrary, and the new organisation should be under the supervision of the Council. The panel is aware of the delicate balance here. The Registrary needs to have

influence over, and oversight of, those systems which support the business processes and reporting requirements for which he is ultimately responsible. On the other hand the provision of the flexible computing services required by the wider academic community in the University (both students and staff) may not be seen by many as a natural function of the UAS.

87. The panel proposes that the ISSC should have effective oversight of the budget of the new organisation; the panel recommends that the budget should be proposed by the ISSC, based on a proposal from the Director, for scrutiny in the annual Planning Round.

88. The panel is not inclined to propose specific changes in the services offered by the two central units in the short term. The selection of the services which are provided will need to evolve, as driven by the academic and administrative needs of the University and Colleges. That evolution must be driven not by the views of this panel, formed at one point in time, but by the users, through the proposed governance structure.

Recommendation C3.
The existing central provision of services including e-mail, the backbone network, the JANET connection, and the provision of information services such as CUFS, CHRIS and CamSIS, should continue, with future priorities determined by the ISSC.

89. Finally, in the light of the evidence presented to the panel on services in Schools and Departments, and discussed in section D, it is clear that there needs to be, as part of the central service provision, an affordable desktop service which Schools, Faculties and Departments (as well as other institutions) can simply purchase and which meets the minimum service levels to be set by the ISSC. This would enable Institutions to meet their obligations to deliver a standard service without having to build it themselves, duplicating work undertaken elsewhere. The availability of such a service is key to allowing local staff to be relieved of routine work, and to supporting the recommendations around the delivery of a guaranteed minimum standard of service to staff and students. While the details will be for the new Committee, it should be sufficiently flexible to cope with the varied needs of both administrators and academics, and support Windows, Linux and Macs. It is not the intention that this should preclude the use of services provided by other organisations, provided they meet the standards set by ISSC.

Recommendation C4. There should be a central service that offers an affordable supported desktop service to Schools, Departments and Institutions.

SECTION D - SCHOOLS, DEPARTMENTS AND INSTITUTIONS

90. The panel received evidence from people from Faculties and Departments, across all the Schools. Inevitably the situation varied between different Schools and Departments. Larger Departments tended to be fairly satisfied with their service provision. Typically these Departments had teams of Computer staff, who were able

to take responsibility for different aspects of the service; provision in these Departments was planned, and there was a systematic approach to managing requests for help. These Departments tended to be able to innovate, and develop (for instance) local front-end modules for centrally provided Information Systems with the result that their users had a system which was well matched to their needs.

91. Against that, the situation in smaller institutions was sometimes less positive. The panel heard worrying accounts of severe difficulties in some smaller institutions. In one case, a power surge had brought down servers, and the resulting problems had not been resolved for several weeks at a very busy time of year. The impact had been severe, particularly on administrators, who, unlike some academic staff, did not have the option of using College systems, and who did not know, from day to day, whether they would have a workable system. The situation had led to real problems for the institutions' small teams of Computer staff, who felt that it had not been possible to get urgent practical help from experts elsewhere in the University, perhaps because it was seen as a local problem. More detailed investigation indicated that the system had simply been stretched well beyond what it was designed to cope with. This suggests, perhaps, a lack of time for strategic planning, and lack of resources for the system's development.

92. Although the views from Departments differed, there was no indication of widespread dissatisfaction with the underlying model in which decisions about service provision are taken locally rather than centrally, and central services are offered rather than imposed. There was also no widespread dissatisfaction with the services provided, although some individuals felt their services were not as good as they might be. The panel felt that the professed satisfaction of many staff with their local provision might, at least in part, be the product of ignorance of the types of facilities that could be made available in a modern well-managed university.

93. Another common theme across Departments large and small was the value placed by users on having local, responsive, and expert support from dedicated IT staff who understood the needs of the institution. That said, there was also evidence of the problems which resulted from those local IT staff having to provide and manage everything from the point of presence onwards, including networks, servers and desktop machines, as well as local information systems and websites, alongside some local training requirements and technical support for audio-visual systems. Local staff might also need to support research computing. In some cases local provision depends on just one individual, with a single point of failure posing an obvious risk to the operations of the institution.

94. The panel felt that local provision of those service elements which are generic across many departments (networks, servers and standard desktops) is inherently inefficient, leading to duplication of the work in other institutions, taking local staff away from tasks where their specific local knowledge and particular skills could be more profitably applied.

95. There was some suggestion that local provision of basic computing in some smaller departments was less up to date or effective than it might be, perhaps as a result of local staff not having the time, amongst all the other pressures, to plan strategically how the local provision should be developed and updated. There was also a risk of lone Computer Officers operating in isolation, despite the provisions for information sharing with colleagues, and being unaware of solutions and new developments elsewhere in the University, which they might be able to adopt. Such staff were often managed by people who had no particular technical knowledge, and who as a result were unable to provide either support or constructive challenge to the local IT staff.

96. Uncertainty of funding was also cited as a contributory factor to the lack of strategic planning, particularly in smaller institutions, where there is unlikely to be the flexibility to smooth fluctuations in funding sources to manage IT investments. It was also clear that there were many instances of grant-funded Computer Officers or Post-Doctoral Associates spending time on routine desktop support or systems administration. Apart from the impact on the individual, where there can be benefits as well as costs, this can pose real risks for Departments' ability to retain and manage continuity of expertise.

97. The panel received evidence on departmental computing from the Head of the Clinical School Computing Service (CSCS), which is a large provider of utility computing to about 2200 users in the School of Clinical Medicine, through a charged-for generic service to many smaller Departments, using industry standard and mature products. More sophisticated "academic" IT is the responsibility of Departments. The CSCS provides a network to each desktop, supporting devices running Windows, Mac-OS or Linux, and they run an Exchange server for e-mail and calendars as well as a help desk, which operates largely by telephone or e-mail. The charges made include provision for a sinking fund for replacement of network equipment, but not individuals' desktops, although they are happy to procure devices for individuals. The result is that CSCS recovers costs for the network, data, storage, helpdesk and support.

98. The CSCS has had to address the question of local versus central service as it has expanded its operation across the School (moving from supporting about 650 desktops in 2007 to around 2200 now). Their experience has been that Departments have been happy with the remote help-desk support model, backed by a strong service culture. The comment was also made, after the experience of migrating many departments and users onto the service, that customer requirements tend to be more similar than departments themselves sometimes believe.

99. Particular advantages of this approach were: greater clarity about the total costs; more opportunities and variety for staff, as a result of working in a larger IT organisation; a consistent approach that simplified the overall network, making it easier to solve problems when they occurred, and allowing the retention of a small stock of spares in house which could be used to fix very quickly and easily a large proportion of the problems which arose; there were also economies of scale in

purchasing. Above all, the CSCS has been successful in driving a service culture, in which there was a sense of accountability to the users.

100. The panel met a representative of Zoology, a Department that was in the process of migrating its basic IT desktop provision to the CSCS system, following a review of its existing internal provision. Although the migration was not complete at the time of the discussion and was taking longer than originally planned, the impressions of CSCS had been extremely positive, and fears about the quality of support had not been realised.

Conclusions and Recommendations

101. In the light of the evidence from larger and smaller Departments, a number of points are clear about the future of provision in institutions. First, decision taking and budget management, in a devolved structure such as the University, need to remain devolved. Second, while there was obviously a great deal of informal networking and mutual support, there was a need to strengthen collaboration between institutions so that decision taking could reflect mutual experiences across Departments, sharing of best practice could be improved, and more effective cover could be provided for IT staff. The panel therefore felt that Schools would usually be the right level at which to take decisions about provision and how it would be organised to meet the University's minimum standards, within available resources. The panel was also mindful that some larger Departments were very successfully operating their own provision, and would see little to be gained by having decisions taken at the School level. There must be flexibility for responsibility to remain with Departments, subject to the minimum standards being delivered.

102. It is clear the University should promote opportunities for a wider range of Departments, especially the smaller ones, to purchase from the centre their essential "utility" computing, such as provision of desktops, file storage and back-up, and the operation of the local network. This is in line with recommendation C4 about the need for an affordable central service. Evidence suggests that support for routine computing operations can successfully be provided remotely, despite the initial fears of staff in Departments that this would cause problems. It is also likely that many Departments will wish to retain some local support, to handle matters other the basic provision of networks and desktop services. If that local support team is relieved of the day-to-day maintenance, it will be more able to undertake specific activities which add more value to the Department.

Recommendation D1.
Schools and non-School Institutions should have responsibility for ensuring that their staff and students have access to the levels of service set by the ISSC and referred to in A3 and A4. Schools, Departments and other Institutions should consider whether this can most effectively be done by local provision, at School level, or by use of a centrally provided service.

103. The work at School level will require some expertise and resource in IT matters at School level, and the panel recommends the appointment of School-level IT Co-ordinators. IT Co-ordinators should:

i. provide a key professional and technical point of contact between the School or Institution and the central providers;
ii. be a member of the ISSC Operations Sub-committee;
iii. facilitate the transfer of best practice within their School, between Schools, and between the centre and the Schools;
iv. advise the School and Faculties/Departments on their compliance with the University's standards of provision.

Recommendation D2. Each School and non-School Institution should identify or appoint one or more IT Co-ordinators.

SECTION E - IT STAFF

104. The panel met a number of Computer Officers themselves, while others explained how they viewed the work of the Computer Officers they knew. The main interest was in those Computer Officers who were based in Departments, rather than in the central units.

105. Overall, the evidence was very clear that there are many very dedicated, and highly skilled, Computer Officers in Departments and in the central organisations. They are highly committed to supporting their Departments and their dedication, local knowledge and flexibility are much appreciated by the academic and other staff who rely on their support. They frequently work long hours, or come into work when they should be on holiday, in order to resolve problems. They are expected to (and do) deal with a wide range of issues, from maintaining the local networks to managing local databases and information systems.

106. The issues that confronted the panel were therefore around whether the University could make better use of the skills of this important group of staff, and whether more could be done to support them, improve training and career progression opportunities, and reduce the pressure some of them appear to be under.

107. It was clear that in those Departments and Faculties where there is perhaps only one dedicated CO, or a very small team of COs, that person or team can be under considerable pressure since they will be expected to look after all elements of IT in their institution, with little, if any, expert back-up or support. They may worry about what will happen if they take leave to which they are entitled.

108. It is easy to see the negative consequences of this pressure on staff. Stress and reduced job satisfaction will have a negative impact on both the individuals and the Department they serve. A lack of time for planning and improvements risks a gradual

decline in the level of service. A lack of training will lead to skills and knowledge becoming outdated. Tackling these issues is important where the technology and customers' demands move as fast as they do in the provision of IT in a research-intensive university. That said, many people spoke highly of the effectiveness of the networking, ideas sharing and mutual support that takes place between Computer Officers in different departments. It was also clear that staff in many departments, with great goodwill, have made practical informal arrangements to provide cover for each other.

109. Section D mentioned problems that can arise when there is a lack of IT expert management of local computer staff. This lack can have other implications. One submission to the panel expressed concern that promotion and probation processes would be unlikely to operate as effectively as they should, with obvious detriment to the individuals concerned, and possibly the institution.

110. The submissions to the panel showed that many people in the University share the concern about how best to develop and manage our IT staff, and feel that greater mobility is required. A wide variety of solutions was suggested. The UCS, perhaps unsurprisingly, argued that departmental IT support, at least for the provision of day-to-day IT infrastructure, should be brought under the management of the UCS, in order to widen experience, provide opportunities, and provide the flexibility to cover fractional FTE support for smaller institutions, within their limited budgets. Another submission proposed that IT support needed to be in teams of at least 5, to provide the critical mass needed to cover a full range of skills. Such teams could be formed at School level, to achieve a balance between having large enough teams to provide flexibility and career development on the one hand, and having local knowledge and expertise on the other. These suggestions reflect the proposal made in the 1993 Swinnerton-Dyer review to deploy Computing Service staff as user support teams for each School, remaining employed by the Computing Service, but working in close association with expert IT advisory committees in each School. It is worthy of note that the Swinnerton-Dyer report also recommended that: "*Ad hominem* promotion should be a recognized way of rewarding outstanding work carried out by Computer Officers on the establishment of Faculties and Departments." The motivation for this was to provide career progression for Computer Officers who would otherwise have no such route.

111. It should be noted that not all the submissions to the panel argued whole-heartedly for a more centralised or co-ordinated approach to the management of IT support. The UCS pointed out that this might well not be appropriate for IT staff who were grant funded and dedicated to the support of one particular research area. More generally, as noted above, many submissions advocated the retention of local support, on the grounds that the local expertise was vital. Local provision of support that is responsive to departmental needs is not inconsistent with management or co-ordination of that support at School or central level, but the responses do illustrate the need to ensure that any move towards greater co-ordination does not unduly damage what is perceived as one of the strengths of our current system.

112. The panel was aware that within the University structure, where individuals are employed essentially by one institution, moves towards greater mobility and flexibility are not necessarily easy to make. On the other hand, the panel was impressed by the fact that the Clinical School Computing Service had been able to tackle the challenge and had successfully re-deployed some staff into a larger central team.

Conclusions and Recommendations

113. Reflecting on this evidence reinforced the panel's view that part of the solution lay in allowing Departments and Faculties to buy in standard desktop services including the local network and server back-up. This was discussed earlier in the report, in Section D.

114. The panel felt this would not be enough. To ensure that the University as whole was making the best use of the skills of its expert staff, providing them with the best working conditions, training and professional development and career opportunities, and was able to deploy them flexibly, the panel therefore concluded that the University as whole needed to look at the career structures and employment arrangements of Computer Officers. The development of the new central services organisation proposed in Recommendation C2 will need to support this. Of course, providing the best possible career and development opportunities will also assist the University in recruiting and retaining the very best staff in a competitive market.

115. The panel did not wish to prescribe the exact solution, partly because of the difficulties involved in moving away from institutional employment, partly because it was possible that a solution for one part of the University might well not work in another, and partly because the details of such a reform are properly within the remit of the new governance structure that the panel recommends. The panel felt, however, that the ideal situation might be that COs were part of a wider team at, say, School level, rather than being rigidly employed by one Department. Such an arrangement would allow for the required flexibility while maintaining the local knowledge felt to be so important, and sits well with the recommendation in Section D about School level co-ordination.

116. A final reason for not setting out a prescriptive recommendation was that the challenge of greater flexibility and mobility for IT staff has a great deal in common with the challenge of promoting greater mobility among generalist administrators in the wider University, and that work on the arrangements for IT staff might benefit from proceeding in parallel.

Recommendation E1. The University, Schools and Institutions should review the career structures and employment arrangements of its computing support staff with urgency, with the aim of improving the mobility of individuals, and the flexibility of teams.

SECTION F - INFORMATION SYSTEMS

117. The provision of Information Systems is a central part of the IT work of the University. Efficient and easy-to-use systems are vital both for the internal management of the University and the fulfilment of its external obligations. Staff and students have a right to expect that these systems will be delivered to the standard expected of a major organisation.

118. By the nature of the work involved, MISD is far more closely involved than UCS in this area. MISD are responsible for the major business-critical systems at the core of the University's administration. The three major systems, CUFS CHRIS and CamSIS are commercial Enterprise systems respectively for finance, HR, and management of the whole student cycle from first contacts and application to graduation. CUFS is based on the Oracle E-business suite; CHRIS, for HR records and payroll, is based on the iTrent system from Midland HR. Both of these systems have recently been the subject of a strategic review to determine the next generation of systems; ongoing maintenance and development costs over £2M pa. CamSIS, while based upon the Oracle Enterprise Student System, has been extensively expanded to cover all areas of Student Administration, including the needs of all 31 Colleges, Institutions and Departments who rely on CamSIS for the common student academic record, managing academic processes and statutory reporting.

119. MISD also have a development team responsible for creating tailored systems in areas not covered by the main Enterprise systems. For instance, in the HR sphere, there is the recruitment administration system (RAS), which manages advertising and permissions to fill posts; there is a system for payments to people who work irregularly or casually for the University. MISD is engaged on a programme of renewing or providing additional systems; RAS is being updated; a system for e-recruitment is under development, and a system for on-line payslips is operational. On the Finance side the grant costing tool, pFact, is due to be replaced by the new X5 system currently under development, as part of work on improving the services which support research. Another area has been supporting intranet and collaboration sites developed in Microsoft SharePoint. Specific projects at the moment include Employee Self Service (ESS), postgraduate awards management and payment system (BGAwards), equipment sharing and REF Information management.

120. A large proportion of the submissions to the review commented on the systems provided by MISD and a consistent picture emerged. The major Enterprise Systems (CUFS, CHRIS, CamSIS) which are critical to the management of the core functions of the University, and to the delivery of its statutory reporting requirements, are seen to be successful at meeting the needs of the central divisions (e.g. Finance or HR) which they support. There is a strong sense of ownership of systems by the associated divisions, and their senior staff are closely engaged with MISD in systems development. That close engagement with the development takes two forms. First, the central UAS divisions clearly have a great deal of influence over the direction in which developments are made. A hypothetical example might be, in HR, a decision

to prioritise the development of e-Recruitment over the development of an on-line system for the grading of posts. Second, the central divisions inevitably have a great deal of influence, compared to Schools and Departments, over the detailed functionality and usability of the system.

121. A consequence of this approach to delivery of these systems is a perception, in many academic parts of the University, and reflected in submissions to the review, that the Enterprise systems are often non-intuitive, require significant investment of time in training, and are more difficult to use than they need to be. This is particularly so for those who have to use them only occasionally, rather than on a daily basis. This is a significant issue when people are accustomed to highly intuitive commercial web-based systems, such as Amazon. The panel was aware that MISD are working hard, in various ways, to involve Departments and institutions more fully in all stages of the development of their systems, and to improve the user experience, but the felt this needs continuing effort. It is also important to note that the engagement with Departments is often limited not by the willingness of MISD, but by the amount of time stretched administrators and other people in Departments are able and willing to devote to it. There are also real limitations in the adaptations that can be made to commercial systems without incurring significant costs.

122. Some of the submissions to the panel made more specific suggestions. One made the point that it would take several years to acquire the skills, across the organisation, to achieve a sufficient understanding of user requirements properly to determine whether a specification is fit for purpose. Related to this was the suggestion that the thinking has become very based on systems, rather than on the strategic objectives of the organisation, and how the systems can best support their achievement. Another point made was that the cost of users' time is rarely, if ever, built into the analysis of the costs of a system.

123. A number of the submissions to the panel commented on services which the authors felt should be provided by the central organisations and which in fact were not. Although these are not, strictly speaking, information systems, it would seem sensible for the new governance structure to take decisions on whether to invest in them by much the same approach. Examples were: central provision of back-up storage; training on website provision for those who lacked the IT skills to use more sophisticated systems; better co-ordinated software purchasing schemes, (although this last issue is now being addressed).

Conclusions and recommendations

124. The panel concluded that the whole process of specifying and developing these systems needed to continue to become more user-centric, in particular for users outside the central bodies.

Recommendation F1.

An intuitive user interface is a critical component of modern systems, and Project Boards for the development and purchase of particular systems must ensure that this is considered at every stage of development.

125. While appreciating the overriding importance of statutory requirements and the need for effective management systems, as well as the recent efforts of MISD and the practical difficulties of involving large numbers of people, the panel felt that the parts of the University outside the centre could be involved further in decisions about the direction in which to develop information systems. The panel sees this as an issue which the new ISSC should be well placed to tackle.

126. While acknowledging the current activity in this area, in particular the new work on research grant management, the panel also concluded that the ISSC should urgently review the strategic direction of the work to improve the provision of systems to support the regular business of staff, also including such items as room booking and management and payment of expenses.

Recommendation F2.
The ISSC should strengthen the involvement of Schools and Departments in decisions about strategic investment in information systems to ensure that their needs are properly considered alongside those of the central administration.

Recommendation F3.
The ISSC should review whether urgent action is needed to provide basic user-oriented facilities to assist with the everyday business of academic and administrative staff.

127. One result of the diversity of needs across the University as well as perceived lack of user-friendliness of some of the information systems is that Departments, particularly large ones which are well resourced, choose to build their own front end systems so that the central system operates in a way which better meets that Department's needs, as well as providing additional functionality. The submissions and other evidence received generally supported such work and the panel concluded that this was a sensible approach; given the diversity of the University it was not sensible to expect one system to meet all requirements. The panel was pleased to note that MISD has been supporting this approach and it is important that major central information systems are constructed in a modular way with clearly documented interfaces to facilitate the development of such departmental add-ons.

128. The panel is aware that smaller Departments and institutions will not be so able to develop the add-on systems they need. The panel would wish therefore to encourage larger Departments to share their work on these issues, to avoid unnecessary duplication, and to allow less well-resourced departments to benefit from the investments of larger ones. It is precisely this sort of co-operation that the panel would want to see promoted via the new governance structures recommended earlier in the report.

Recommendation F4.
A modular approach to information systems development should be adopted based on a common architecture and public, clearly documented, interfaces to accelerate delivery and stimulate innovation.

SECTION G - RESEARCH COMPUTING

129. The panel took evidence from a number of members of the University who used research computing facilities. As a working definition the panel considered research computing to be work that used sophisticated, often dedicated, systems for complex calculations or the manipulation of large data sets. A number of key messages emerged.

130. The use of complex calculations, and the need to store and manipulate large data sets has moved beyond the Schools of Technology and the Physical Sciences and is now an important feature of work in the Biological, Clinical, and Humanities Schools. There was also evidence that the provision of the necessary equipment and support is sometimes patchier outside the Schools where this type of work originated. The panel felt that there was a challenge for the University in ensuring that researchers in all disciplines had reasonable access to the necessary provision.

131. In the existing provision, the panel observed a mix of central facilities and a large number of locally purchased (and managed) systems, which were often under the control of one investigator. This latter mode of operation has the attractions of giving the investigator complete control over his/her machine and how it is used. In many Departments the investigator would not be charged for the electricity, and might receive (not directly charged) support from local computer staff. It was also clear that, for some collaborations, involving workers from outside Cambridge, having such a dedicated system was the only sensible way to comply with the necessary protocols on the management of data. On the other hand, this approach could mean that valuable space in highly serviced buildings which could be used for experimental work was instead taken up with computers, and the associated cooling equipment, when there was no real need for the equipment to be so located. Further, this might not be the most energy efficient approach.

132. Another issue the panel detected was that way that the support for such systems could sometimes be provided by PhD students or post-doctoral workers, which could often work well, although there was a danger that the individuals could be faced with demands for supporting the system that could leave them insufficient time for research.

133. As for the central facilities, the panel met the Executive Director, and several users, of the HPCS, currently based in the Office of the School of the Physical Sciences. The service, specialising particularly in massively parallel computation, is greatly appreciated by its users, particularly for its expertise and ability to tailor solutions to individual needs. Charges to users, typically met by Research Council

grants, largely cover its costs, which are mainly electricity, staff and provision for renewal of its capital equipment. A further cost is the HPCS policy that 20% of the available time on its machine is allocated free of charge. This is a deliberate (and appreciated) way of supporting researchers that are new to High Performance Computing, or providing some flexibility for investigators who have a gap in their grant funding.

134. The panel also received evidence that the present institutional location of the HPCS was not optimal. It was argued that the Office of the School of the Physical Sciences was not well equipped, as an essentially administrative and non-operational office, to support the HPCS managerially or technically. A new solution needed to be found, but one which also preserves the best of the current arrangements, i.e. the flexibility for the HPCS to develop relations with a wide range of collaborators, and to deliver the flexible service which is valued by the existing users.

135. The other major central facility discussed was CamGrid, now managed by the UCS. This is a system which works to make available what would otherwise be unused time on (locally owned) clusters across the University. The UCS is now seeking to put in place a more formal structure, including provision for the recovery of costs. Again the panel felt this was a service that was much appreciated by its users who are able to work far more cheaply than would otherwise be possible.

136. Notwithstanding these positive aspects, the lack of a clear central focus puts High Performance Computing in Cambridge generally, and not just the HPCS specifically, at risk of missing out on major strategic funding opportunities because of its fragmented organisation across the University.

137. A further point made concerned the charging models for high performance computing. There was potential for a perverse incentive, where the electricity and Computer Officer time could appear as free goods to the purchaser of (for instance) a local cluster, thus setting an incentive to choose that route rather than use a central service, such as HPCS, which had to cover most of its costs. If this happened in practice (and the evidence seen by the panel varied), this could result in the University as a whole paying more than it needed to, and emitting more carbon dioxide than was necessary. The construction of the Data Centre (*Reporter,* 2011-12, p811) would allow computing to be done with reduced environmental impact; it was important that the financial models provided the right incentives to house equipment in the Data Centre.

Conclusion and recommendation

138. Drawing the evidence together, the panel agreed that there should continue to be a mixture of provision across the University between local clusters and centrally provided and managed facilities. Although the freedom to innovate in this area was critical, the panel concluded there was a need for improved oversight and governance, with the central aim being not to control activity but to deliver a strategy for Research Computing that:

a) ensures that central provision is designed to best meet the needs of the wider University;
b) ensures that researchers have access to the facilities they need, at a manageable cost; and
c) provides financial models incorporating incentives to minimise the cost to the University, in terms of money, carbon dioxide and space. The governance of the new Data Centre will be a key part of this.

139. The panel felt that the strategic needs of the University for Research Computing require definition and oversight by a separate sub-committee of the ISSC, clearly driven by the interests of the key users. Central high performance computing facilities should in future be managed through the new ISSC and its Research Computing Sub-Committee as one of the central services and, probably, part of the merged central service provider. A further challenge will be the provision of central facilities for the storage of increasing amounts of data, and open access both to publications and to the underlying data.

Recommendation G1.
The oversight of provision of large-scale high-performance computing should become a University-level responsibility.

Recommendation G2.
There should be an ISSC Research Computing Sub-committee that takes responsibility for the provision and coordination of high performance research computing facilities.

140. As with the Operations Sub-committee (para 68), the panel does not wish to dictate the details, but would suggest that the tasks of the Research Computing sub-committee should be to:

i. develop and implement a strategy for high performance research computing;
ii. oversee the management of the High Performance Computing Service;
iii. ensure that the reasonable needs for high performance computation and data storage are met, drawing on centrally provided facilities, and collaborative shared operations, such as CamGrid, as well as specifically purchased equipment;
iv. establish a coherent financial framework for the costing of research computation, so that there are appropriate incentives for Departments to use the Data Centre and/or centrally provided services;
v. ensure that the management of high performance computing is consistent with the University's carbon strategy;
vi. ensure, by providing a clear central focus for HPC work, that Cambridge is well placed to benefit from Government and RCUK finance, as available.

141. The membership of the Research Computing Sub-Committee should include:

a) The PVC Research or deputy as Chair;
b) The Information Systems and Services Director;
c) School Representatives;
d) Senior representatives of research groups with different needs for high-performance computing and data management;
e) In attendance, the managers of centrally provided services for high-performance computing.

SUMMARY OF PRINCIPLES AND RECOMMENDATIONS

142. The principles and recommendations are summarised here.

Principles

A1. The aim of this Review has been to make proposals to help the University obtain the best value from its considerable investment in IT, not to cut costs. There is absolutely no intention that this review will lead to redundancies.

A2. As a leading University, in the UK and the world, we should expect the quality of our information services and systems to be commensurate with our standing.

A3. Every member of staff whose role requires access to information technology should have, at minimum, access to a desktop providing an appropriate level of service.

A4. Every student should have access to the computing facilities and network services necessary to properly pursue their course.

A5. The University needs information systems that promote efficient and effective administration and support its statutory reporting requirements.
A6. The governance and organisation of information services and systems should be driven by a strategy that is based on a clear understanding of user needs. The strategy needs to respond to and exploit the opportunities provided by technological developments.

A7. In order to provide world-class information services and systems, high priority should be given to the support, development, and retention of talented and committed computing support staff. The University should provide these staff with high-quality career opportunities, and make the best use of their skills.

A8. In Cambridge's devolved structure, there should be space for innovation in service provision, and different Institutional needs should drive the design and delivery of the services that are provided. Schools and Institutions must accept

joint responsibility with the University for delivering the minimum levels of service referred to in A2 and A3.

A9. The governance structure should ensure that the University's needs for information services and systems are met in a way that reduces carbon dioxide emissions as much as is practicable.

Recommendations

B1. The Information Strategy and Services Syndicate should be replaced by a strengthened Information Services and Systems Committee (ISSC) which is better equipped to shape and drive the provision of high-quality information services and systems across the University.

B2. There should be an ISSC Operations Sub-committee that takes responsibility for the delivery and day-to-day operation of the University's information services and systems.

C1. The University should appoint an Information Services and Systems Director.

C2. The UCS and MISD should be merged into a single organisation under the leadership of the new Director as soon as possible. The ISSC should examine whether other central service providers should also migrate to the new organisation.

C3. The existing central provision of services including e-mail, the backbone network, the JANET connection, and the provision of information services such as CUFS, CHRIS and CamSIS, should continue, with future priorities determined by the ISSC.

C4. There should be a central service that offers an affordable supported desktop service to Schools, Departments and Institutions.

D1. Schools and non-School Institutions should have responsibility for ensuring that their staff and students have access to the levels of service set by the ISSC and referred to in A3 and A4. Schools, Departments and other Institutions should consider whether this can most effectively be done by local provision, at School level, or by use of a centrally provided service.

D2. Each School and non-School Institution should identify or appoint one or more IT Co-ordinators.

E1. The University, Schools and Institutions should review the career structures and employment arrangements of its computing support staff with urgency, with

the aim of improving the mobility of individuals and the flexibility of teams.

F1. An intuitive user interface is a critical component of modern systems, and Project Boards for the development and purchase of particular systems must ensure that this is considered at every stage of development.

F2. The ISSC should strengthen the involvement of Schools and Departments in decisions about strategic investment in information systems to ensure that their needs are properly considered alongside those of the central administration.

F3. The ISSC should review whether urgent action is needed to provide basic user-oriented facilities to assist with the everyday business of academic and administrative staff.

F4. A modular approach to information systems development should be adopted based on a common architecture and public, clearly documented, interfaces to accelerate delivery and stimulate innovation.

G1. The oversight of provision of large-scale high-performance computing should become a University-level responsibility.

G2. There should be an ISSC Research Computing Sub-committee that takes responsibility for the provision and coordination of high performance research computing facilities.

ANNEX 1

Review of IT Infrastructure and Support: Notice

At its meeting on 6 December 2010, the Council accepted the recommendation from the Working Groups on Organizational and Financial Efficiency that there should be a full review of IT infrastructure and support across the University.

The membership of the Review Committee is as follows:

Professor Keith Burnett, Vice-Chancellor of the University of Sheffield (*Chair*)

Alison Allden, Chief Executive, Higher Education Statistics Agency

Professor Howard Chase, Head of the School of Technology

Professor Steve Oliver, Chair of the Information Services and Strategy Syndicate

Dr Rachael Padman, Member of Council and General Board

Professor Steve Young, Pro-Vice-Chancellor for Planning and Resources

Dr Jim Bellingham, Secretary of the School of the Physical Sciences (*Secretary*)

The terms of reference are as follows:

1.The Review Committee is charged with making recommendations to the Council and General Board for the governance, organization, and strategic development of IT infrastructure and support across the University, excepting only that provision made by the Colleges.

2.The Review Committee is asked in particular to consider:

•the scope and content of the strategy for IT infrastructure and support and the services to be provided;

•the appropriate governance structure to develop the strategy, keep it under review, and monitor its effectiveness;

•the appropriate management structure to implement the strategy and deliver the services taking account of opportunities for shared services and out-sourcing;

•the most effective and efficient organization of computing support staff within the central services and elsewhere;

•the annual budget, and provision for capital.

Modus Operandi

While the Committee will need to establish the detail of its *modus operandi*, it is expected to be broadly as follows. There will be a call for evidence (see below), and consideration of that evidence and other material. It is expected that the Committee will hold a small number of open sessions in the Michaelmas Term, followed by interviews. It is then expected that the Committee will publish a draft report and recommendations for discussion across the University, before finalizing its report to the Council and General Board.

Call for evidence

Any member of the University with observations that will assist the Review Committee should send them to Dr Jim Bellingham, Secretary of the School of the Physical Sciences (email **jrb13@cam.ac.uk**) by 31 August 2011. There will also be a discussion forum on the intranet for the submission and discussion of views.

Evidence or views on any aspect of the review are welcome, but it would be of particular interest to the Committee if views could be submitted in particular on:

•the need for a more coherent IT strategy across the University;

•whether the present management structure including two central organizations (the University Computing Service (UCS) and the Management and Information Services Division of the Unified Administrative Service (MISD)) can be improved;

•whether the University at present has the right balance between centrally and departmentally managed provision;

•whether there are aspects of the current level of service which could be improved;

•whether the design and implementation of large IT systems adequately reflect the needs of users, and if not, suggestions as to how this can be improved;

•whether we have the right arrangements in place for the effective and efficient organization of computing support staff, and whether more can be done to provide appropriate career structures and opportunities;

•whether there is scope for cost savings and/or service improvements through greater sharing of services, or out-sourcing.

ANNEX 2

The panel received written submissions from:

University Computing Service
Management Information Services Division
Information Strategy and Services Syndicate
The Faculty of English
Department of Chemical Engineering and Biotechnology
The Faculty of Law
The Department of Engineering
The College IT Managers Group

Dr Kirsty Allen and Ms Tamsin Mann (joint), Registrary's Office
Mr Richard Bartlett, MISD
Professor Jeremy Baumberg, Physics
Dr Mike Bithell, Geography
Wendy Cooke, POLIS
Mr Ronald Haynes, UCS
Mr Jon Holgate, CSCS
Ms Helen Jackson, Joint Head of Legal Services
Mr Martyn Johnson, Computer Lab
Professor Rob Kennicutt, Head of the School of the Physical Sciences (SPS)
Mr Steve Kimberley, Classics
Ms Lesley Lancaster, Philosophy
Professor Ian Leslie, Computing Lab
Mr Martin Lucas-Smith, Geography
Mr Nick McLaren, UCS
Mr James Matheson, Engineering
Dr Simon Moore, Computing Lab
Professor Alan Mycroft, Computing Lab
Mr John Norman, CARET
Professor Andy Parker, Physics
Professor Mike Payne, Physics
Dr Michael Rutter, Physics
Professor Jeremy Sanders, PVC, Institutional Affairs, formerly Head, SPS.
Ms Heather Sanderson, Philosophy

The following contributed to discussions on the web forum:
Bruce Beckles, R Charles, Stephen Cowley, Alastair Downie, Simon Edwards, Julian King, Espen Koht, Martin Lucas-Smith, Nick Maclaren, GH Newton, Rachael Padman, Craig Peacock, Jon Peatfield, Gareth Rees, Jon Warbrick.

The panel considered a range of other documentation, including:
Annual Reports from the UCS and ISSS
The Swinnerton-Dyer Review of Academic Computing, 1993
The Report of the IT Review of the School of the Physical Sciences, 2010

ANNEX 3

The full panel met five times during the academic year, and there were other informal meetings of members to gather information or discuss specific points. The following met the panel or some members of it to provide evidence:

Richard Bartlett, Computing Officer, MISD
Milly Bodfish, Acting Secretary of the School of Arts and Humanities
Paul Calleja, Director, High Performance Computing Service
Paul Dampier, Director, MISD
Dr Tim Dickens, Hd of IT, Chemistry
Professor Dame Ann Dowling, Hd of Engineering
Jon Holgate, Clinical School Computing Service
Professor Ron Horgan, DAMTP
Julian Jacobs, Departmental administrator, Zoology
Dr Stephen Jolly, Director of Communications
Dr Ian Lewis, Director, UCS
Dr Karen Lipkow, Systems Biology
Dr Richard McMahon, IoA
James Matheson, ISSS
Dr Jonathan Nicholls, Registrary
John Norman, CARET
Professor Andy Parker, Physics
Professor Mike Payne, Physics
Jennifer Pollard, CO, English
Ian du Quesnay, ISSS
Dr Paul Russell, Head of Anglo-Saxon Norse and Celtic
Professor Ian Roberts, Faculty Chair, Modern and Medieval Languages
Paul Taylor, CO, Engineering
Liv Watson, President, Graduate Union
Nick Wilson, ISSS

ANNEX 4

RESOURCES

Table 1 – Computing Staff across the University since 2003
(Source - *Reporter* 2011-12, p656.)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Schools	189	210	213	219	222	224	222	226	231	225
UAS	26	36	44	47	48	49	55	59	61	60
Academic services	92	87	93	98	98	97	95	93	89	90
Other	5	4	5	5	8	8	8	8	9	10
Total	311	336	354	369	376	378	380	386	391	385

It is important to note here that the Academic Services heading includes UCS staff. One significant point here is that the greatest growth area, at least in the last ten years has been in the UAS, which reflects the increased investment in Information Systems since the difficulties with CAPSA around the turn of the millennium. There has also been growth in the staffing in Schools and Departments since 2003, but most of that growth took place early in the period under consideration, and now appears to have levelled off.

It is also important to note that this data may not capture Computer Staff in Departments employed on grants.

Table 2 – Annual staff costs, including on-costs, for 2012. (estimated by HR Division using the same underlying data as for Table 1, using a flat rate for on-costs).

Organisation	**Staff FTE**	**Annual Salary costs (with on-costs) (£M)**
Schools & Academic Institutions	225	11.3
UAS & VCO	60	3.4
Academic Services	90	5.1
Other	10	0.5
Total	**385**	**20.3**

Table 3 – Chest budgets for central organisations.
(source – Chest Expenditure Budgets – "Thin Blue Book")

Year	UCS	MISD	Admin funds	Total
2011-12	4,953,000	6,167,635	2,434,000	12,162,635
2010-11	5,054,000	5,381,331	3,663,765	11,435,331
2009-10	4,902,000	5,529,000	3,150,000	10,431,000
2008-09	4,815,000	5,386,651		10,201,651
2007-08	4,630,100	5,100,379		9,730,479

The figures in the "Admin funds" column indicate the total expenditure of the funds for ISSS priorities, Technology Developments, and funds for development of specific systems such as CamSIS or CHRIS. These are allocated separately from the core UCS and MISD budgets.

Table 4 – Non-central IT spend, excluding staff.
(source, data from Accounts payable provided by the Purchasing team. These data include IT spending outside the University, by all institutions except UCS and MISD. Internal purchases by one department from another have been excluded to avoid double counting.)

Year	Spend (£M)
2010-11	10.8
2009-10	6.6
2008-9	6.3

The significant increase between 2009-10 and 2010-11 appears to have been due to a number of separate significant investments across the University.

Table 5 Estimated total IT spend for recent years
(sources as above tables)

Heading		
	2009-10	2010-11
UCS – Chest budget	4.9	5.1
UCS – Cost recovery	3.6	4.2
Admin funds	3.2	3.7
MISD Chest budget	5.5	5.4
Other institutions – staff	11.1	11.5
Other institutions – non-staff	6.6	10.8
Total	**34.9**	**40.7**

Table 6 – development of UCS cost recovery
(source – UCS annual reports)

Year	Recovery (£k)
2010-11	4241
2009-10	3648
2008-9	2939
2007-8	2354

Table 7

This table shows the results of an informal survey of some 17 other Russell Group Universities about the IT services and systems they provide. The three columns headed RG peers indicate how many of the 17 responses were in each category.
Although this needs to be treated with some caution, in that the situation is often more nuanced than is indicated by the simple answers here, the message is clear that Cambridge lags in some areas.

	Cam	RG Peers Yes	RG Peers Partial/WIP	RG Peers No
Is there clear guidance in one place for new staff and students on how to get access to the IT services they need?	Yes	16	1	0
Is there a single sign-on system for access to information and other services through a web portal?	No	13	1	3
Is wireless access widely available across the campus?	Yes	15	2	0
Is there access to High Performance Computing for research needs?	Yes	16	1	0
Do investigators have access to large scale data storage, provided by the University?	No	9	3	5
Is there central back-up storage for Departmental systems?	No	13	1	3
Do you provide file storage space for undergraduates?	Yes	16	0	1
Is there an on line room booking system across the campus?	No	16`	1	0
Is there a system by which PIs can get easy web access to information on expenditure on their grants?	No	15	1	1
Is there an on-line system for expenses claims?	No	7	4	6

WIP indicates work in progress

INFORMATION STRATEGY AND SERVICES SYNDICATE

1.The Information Strategy and Services Syndicate shall consist of:
(*a*)the Vice-Chancellor (or a duly appointed deputy) as Chairman;
(*b*)three persons appointed by the Council;
(*c*)three persons appointed by the General Board of the Faculties;
(*d*)three persons appointed by the Colleges' Committee;
(*e*)one person elected from among their own number by the officers of the University Computing Service;
(*f*)one person elected from their own number by the officers of the Management Information Services Division of the University Offices;
(*g*)two members of the University *in statu pupillari*, co-opted by the Syndicate, at least one of whom shall be a graduate student;
(*h*)not more than two persons co-opted by the Syndicate, provided that it shall not be obligatory for the Syndicate to co-opt any person or persons.

2.The Registrary, the Librarian, and the Directors of the University Computing Service, and of the Management Information Services Division and the Finance Division of the University Offices, shall have the right to attend meetings of the Syndicate.

3.The appointment of members in classes (*b*), (*c*), and (*d*) shall be made in the Michaelmas Term for periods of four years from 1 January following. Members in classes (*e*) and (*f*) shall be elected in the Michaelmas Term and shall serve for two years from 1 January following their election; the procedure for such an election shall be that prescribed in the Single Transferable Vote Regulations, except that the returning officer shall be the Chairman of the Syndicate or a deputy appointed by the Chairman. Co-opted members in classes (*g*) and (*h*) shall serve until 31 December of the year following that in which they are co-opted, provided that if a member in class (*g*) ceases to be *in statu pupillari* he or she shall thereupon cease to be a member in that class.

4.The Registrary shall appoint the Secretary of the Syndicate, in consultation with the Directors of the University Computing Service and the Management Information Services Division and the Chairman of the Syndicate.

5.It shall be the duty of the Syndicate:
(*a*)to establish and keep under review, subject to the approval of the Council and the General Board and in consultation with the Senior Tutors' Committee and the Bursars' Committee where appropriate, an information strategy in support of the aims and objectives of the University and the Colleges;

(*b*)to promote the adoption of the information strategy where appropriate throughout the University and the Colleges, and advise on developments in information technology and its implementation;
(*c*)to keep under review the information requirements of the University and the Colleges, and advise the Council and the General Board on priorities for and other matters relating to the development and application of appropriate information policies, facilities, and services in support of those requirements;
(*d*)to ensure that any such information policies, facilities, and services provided are operating effectively and are fit for purpose;
(*e*)to oversee the direction and planning of the University Computing Service and Management Information Services Division and to approve general principles for the allocation of resources and priorities in the use of their facilities;
(*f*)to be responsible for ensuring that appropriate project and budgetary management and control mechanisms are in place for such major information systems and technology projects as the Council or the General Board may from time to time determine; and to be accountable for the funds allocated for such projects;
(*g*)to make, or amend, and publish rules, subject to approval by the competent authority, for the regulation and security of the use of information technology facilities within the University, and of such computing facilities in College institutions as may be designated for this purpose from time to time by the appropriate College authorities concerned, and to impose on a person infringing one or more of those rules either or both of the following penalties:

(i)the suspension of authorization to use computing resources for such a period as the Information Strategy and Services Syndicate shall determine;

(ii)a fine not exceeding £175.

(*h*)to make an annual report to the Council and the General Board and to the Senior Tutors' and Bursars' Committees.

6.There shall be a Standing Sub-syndicate of the Information Strategy and Services Syndicate on Service Management. The Syndicate shall appoint a Chairman of the Sub-syndicate and the Directors of the University Computing Service and the Management Information Services Division shall be members of the Sub-syndicate, *ex officio*.

7.There shall be a Standing Sub-syndicate of the Information Strategy and Services Syndicate on Network Management. The Syndicate shall appoint a Chairman of the Sub-syndicate following consultation with the Chairman of the Bursars' Committee. The Director of the University Computing Service shall be a member of the Sub-syndicate, *ex officio*.