



The University of Reading

**Case Study on Costing of Information Services
Final Report for
The Joint Costing and Pricing Steering Group**

July 2004

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Information Services Costing Case Study for JCP
SG
Final Report – July 2004**

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1. Project title & name of project leader

Development of a methodology for the treatment of Information Services costs within the Transparency Review.

The Project leader is Annette Haworth, Director of Information Services at the University of Reading.

2. Executive summary

The study examines ways in which information service (IS) costs can be allocated to the activities of schools within the UK Higher Education Institutions (HEIs). The information services included are library; information technology services (ITS); and archives, special collections and museums. The grouping of these costs, and allocation models for them, are discussed. Models have been developed that suit the profile of research, taught courses and students at Reading University and factors listed that other HEIs should consider when developing their own methodologies. The ability to measure service usage levels by user type and School is valuable in the development of future plans and the allocation of resources.

Understanding the ways that services are used and the nature of the various cost drivers within IS is necessary before deciding on cost allocation models. A full analysis of IS resources and usage will highlight a number of important issues both in relation to cost allocation and to the general management of the service. The need to identify the total University resource devoted to IS, in addition to that which is centrally funded, is recognised. In particular, the study helped to focus management attention on areas in need of improvement and the ways in which physical resources are utilised; also that cost allocation models should not be based purely on existing accounting or management divisions but on a detailed understanding of the IS resources and requirements of each School. Ways of adjusting for non-centrally funded expenditure are also discussed.

The method developed can be linked with data on student and staff time to determine the separate cost of information services for teaching and research time in each School for both FTE staff and students. The results of the study are influencing resource allocation decisions and by providing a clearer understanding, for each School, of the split of costs between teaching and research will help to ensure sustainability.

3. Aims and objectives

The study is designed to contribute to the achievements of the JCPSG, in particular:

Objective 1: To secure the continued embedding of good practice in costing and pricing in HEIs;

Objective 2: To work with HEIs and other organisations to promote awareness and understanding of good practice, and to continue to encourage the introduction of this within HEIs' decision-making and management process, so enabling institutions to improve the financial contribution from their activities;

Objective 4: To continue supporting the development of good practice in costing and to communicate this to the sector.

To meet these objectives the study aims to:

- a) Represent good practice in the development and use of cost data in the institutional decision-making process;
- b) Identify a range of financial and/or non-financial benefits that are applicable across all, or part, of the HE sector;
- c) Propose an approach to embedding information services costing which is practical, enduring and sustainable.

4. Implementation

Budget

The budget for the case study was £43,800, of which JCPSG contributed funding of £22,000. The total cost includes staff time, travel for collaboration with the Universities of Newcastle and Nottingham and for dissemination events, plus overheads. Staff time and overheads made up the majority of the costs.

Approach

Staff effort was dedicated to the project through the recruitment of a project officer, Roger Jones, on a fixed term contract.

The project covered the full range of activities within the Information Services Directorate (ISD) of the University of Reading. These are the University Library, Information Technology Services (ITS) and the University Museums and Collections Service (UMACS) – primarily the Museum of English Rural Life (MERL).

Methods used and steps taken

The project had three distinct phases:

- a) In the initial phase a wide variety of usage, financial, space and other data was collected for each of the three activities: library, ITS and MERL. Analysis of this data highlighted differences in the resources used between the University's 23 Schools.
- b) Each School was visited during the second stage in order to understand the drivers behind the varying activity levels. Data was also collected on the extent of School resources (time, space and financial) being used to complement the centrally provided information services. In total there were 43 separate meetings with Schools involving about 60 members of staff.
- c) The data from the first two phases was combined to develop a recommended costing methodology. Evaluation of a number of alternatives was undertaken in order to decide the recommended allocation methodology.

Those involved in the study

The study involved senior managers of the three services within the ISD together with the heads of each School, or their representative(s). Members of the Finance, Facilities Management, Academic Services and Student Services Directorates were also involved. The University's Information Strategy Committee has been kept informed of progress on the project, as have the Senior Management Board. At the request of JCPSG the study has also been undertaken in consultation with the universities of Newcastle and Nottingham.

Stakeholders

All Schools are stakeholders in the project as the outcome will impact on their teaching and research costs. Schools were given details of the study during the visits in the second phase. The end result will be a more equitable balancing of costs in relation to usage; the study will not result in any increase in the total amount of cost allocated to Schools.

5. Outcomes and evaluation

Monitoring

Within the University the Information Strategy Committee and the Senior Management Board monitor progress of the study. An interim report was prepared for HEFCE and progress reports given at the three joint meetings with Newcastle, Nottingham and John Newton, National Co-ordinator of JCPSG.

Results

The study, which is based on data for the 2002/03 academic/financial year, identifies methodologies for the allocation of the three separate elements of Information Services costs. Full details of the study, the results and other findings that arose from the study are given in Section 6 – Appendix.

Achievement of aims and objectives

The aims and objectives, as set out in Section 3 above, were, or will be, met. Methods for transparency cost allocations, that can be embedded, are identified. These methods are practical, enduring and sustainable. Communication of the results and other issues is expected to take place through publication on the JCPSG website and a workshop in the autumn. Results from the study are being input to the University's decision making and management processes. This is providing a clearer understanding of costs and of resource needs. Preliminary findings from the study have already influenced some of the resource allocation decisions taken for 2004/05. Financial benefit will be gained through the more equitable allocation of costs and a clearer understanding of the split between teaching and research in order to ensure sustainability. Non-financial benefit will result from a rebalancing of services to ensure greater equality of provision and identification of spare capacity.

Performance against budget

The project will come in on budget.

Barriers to achievement

All Schools and central support service departments co-operated fully with the study and supplied all information that was requested.

Implementation of the methodology will form part of the 2003/04 transparency cost exercise to be undertaken later this year. Final recommendations will be put to Reading University's Costing and Pricing Review Group in August. The recommended method builds upon data already used for transparency costing. No barriers to achievement are anticipated.

HR and cultural issues

The study does not result in any increase in the overall cost of Information Services (IS) and is not expected to cause any HR or cultural issues for the University.

Unexpected outcomes

There were a number of these that helped in the development and selection of the recommended costing methods. The main ones were:

- a) the scale of the significant disparities between Schools' use of information services
- b) the increasing integration of information provision and support
- c) information provision is becoming more reliant on technology support
- d) the extent to which demand and usage increases with the technological level of the subject
- e) declining use, by academics, of the physical library resource
- f) increasingly varied use of the library buildings by students.

Not all of these, in themselves, were totally unexpected. What was unexpected was the scale and rate of change.

Lessons learnt

A comprehensive study of IS resources and usage will highlight a number of important issues to be considered, not only for the purposes of allocation, but also in relation to the general management of the service. These were the main lessons learnt:

- a) The development of service usage indices for each School and type of service has helped to focus management attention on areas in need of improvement.
- b) The interviews with, and detailed analysis of, every School helped to identify more clearly areas of concern – many of which are common to a number of Schools.
- c) Some of the issues raised will also impact on other central services beyond those directly controlled by the Director of Information Services.
- d) The move towards greater use of technological resources for research needs to be monitored and may impact upon the way in which existing physical resources are utilised.
- e) Cost allocation models should not be based purely on existing accounting or management divisions.
- f) Development of meaningful allocation models requires a detailed understanding of the IS resources and requirements of each School.

Implications of the results

The cost allocation models developed during this study give a better match of cost to use than provided by the existing allocation scheme. The overall result has been to reduce the IS costs allocated to teaching by almost 10 per cent whilst costs to research increase by over 20 per cent and other costs by about 10 per cent (as shown in Table 3). These are not uniform increase across all Schools but vary widely from one to another.

Potential learning points and good practice

Understanding the ways that services are used and the nature of the various cost drivers within IS is necessary before deciding on cost allocation models. It does not make sense to assume that all library costs should be treated the same. Likewise, there are various aspects to ITS which need to be allocated in separate ways. There may be aspects of library costs that can be combined with those of ITS. It may be possible to combine some ITS costs within the library, for the purposes of cost allocation.

The method developed, when coupled with the data on student and staff time will enable a FTE cost of information services for research time to be established for each School (as discussed in Section 6.5).

Sustainability

The method proposed clearly enables the current full economic cost of information services, by School, for research and teaching to be determined. The recommended models satisfy the first step for the management of research for sustainability (establishing and recognising the full economic cost of activities), as set out in the TRAC III guidance, in respect of IS. Full sustainability will require completion of the other four steps: managing the research activity strategically; securing better prices for research; improving project management and cost recovery; and investing in the research infrastructure.

The IS infrastructure in the University is relatively modern and well maintained. Recognition and recovery of full economic costs for IS should help to ensure that these services are sustained.

The proposed models are sustainable and based on currently available information. It is suggested that the base data should be reviewed every few years in order to re-validate the weightings. For management purposes it may also be useful to update the usage intensity analysis in order to monitor the progress of planned service improvements. Any significant change in the type of courses offered by the University, or in the student profile will require weightings to be reviewed. In particular, the growth in availability and usage of on-line access to academic journals and reference materials (e-source) will need to be monitored as usage patterns may change significantly. The total cost of e-sources may reach such a level that it requires a separate model. Conversely, as the proportion of students with their own on-line PCs increases and wireless access becomes more widely available, the demand for PC lab resource may decline and enable these costs to be combined with others, possibly within the library cost allocation model.

During 2004/05 the MERL collection will be moved to a new site in Reading. This will be followed by the relocation of the University archives and special collections. Once complete, the usage patterns should be reviewed and the model adjusted accordingly.

6. Appendix – Details of the study, results and other findings

6.1 Background

In 2002/03 the University of Reading had some 11,400 FTE undergraduate and postgraduate students and about 1,560 FTE academic staff. There are four faculties within the University. Each faculty has a number of schools - 23 in total across the four faculties. The University operates from a main campus and has two further sites in the town. The total income for the year was £137.4 million.

Information Services are under the overall management of the Director of Information Services and comprise:

- the University Library, which operates from two main sites; the largest is on the main campus and covers most subject areas. The smaller library on one of the other sites specialises in the academic subjects based at that site
- Information Technology Services (including telecommunications)
- the Museums & Collections Service – includes a national collection in MERL, which will be relocating to another campus in the town during 2004/05.

In 2002/03, for transparency purposes, the Directorate cost almost £8.9 million (including space/facilities costs and other adjustments) – this is equivalent to 6.4 per cent to total income, of which the general library service and ITS each account for almost 3 per cent with the special collections, archives and MERL accounting for the balance.

The FTE staffing level was 207.

Information services are provided for all academic Schools / departments and to the administrative and other support activities within the University.

6.2 Data availability and collection

Sustainability and endurance are important for any cost allocation model. For this reason, heavy use was made of existing available data.

The registration system used in the University enables both library and ITS users to be categorised by type and School. Separate data is available for staff, undergraduates (UG), taught post-graduates (PGT) and research post-graduates (PGR) in all Schools.

Measuring usage of the various services is important in the development of any costing model. Existing systems enabled the following usage statistics to be analysed:

Library:

- lending
- usage of e-sources (on-line access to academic journals and reference materials)
- inter-library loans (ILL) (data not available by type of user)
- allocation (amount allocated to each School for purchase of books and periodicals)

ITS:

- e-mails sent
- e-mails received
- web hits
- data download
- e-mail server storage
- home directory storage
- PC laboratory usage

A high level of correlation was noted between numbers of web hits and amount of data downloaded, also between the numbers of e-mails sent and received.

For the library, actual data for 2002/03 was readily available. ITS statistics were derived from sample data collected during the study, with adjustments made for changes in School size since last year. The library also houses a number of special collections and archives. Details of the usage of these collections were obtained through interview with their staff.

Similarly, staff from MERL provided details of the services, activities and usage of the museum.

The variation in use of each service by type of user is summarised in the following table (average UG usage = 1, based on FTE academic staff and student numbers).

Table 1: Relative use of services by user type

Service:	UG	PGT	PGR	Staff
Library lending	1	1.6	1.4	0.7
Use of e-sources	1	2.2	8.0	5.6
e-mails sent	1	3.9	5.8	17.2
e-mails received	1	3.9	6.5	20.3
Web hits	1	4.4	10.0	11.0
Data download	1	4.7	9.5	11.0
e-mail server storage	1	2.1	5.9	8.6
Home directory storage	1	2.6	12.7	9.2
PC laboratory usage	1	1.7	1.1	0.2

Interestingly, it can be seen that the usage ratios for e-sources are more directly comparable to those of ITS than to the library, as measured by lending data.

The weightings used in the recommended costing models are based on these ratios (see sections 6.3.1 – Library costs and 6.3.2 – ITS costs).

Looking at usage levels by School also yields interesting results. Table 2, overleaf, summarises the significant variations in usage patterns between Schools (index based on average FTE student use = 100). This data, together with other background information was used as a basis for discussion with each School. See the Annex 1 for an example of the summary information collected for each School.

Table 2, overleaf, demonstrates the wide range of usage of a variety of information services. Examination of each shows that for most the highest level of usage is over ten times that of the lowest, and in one case almost 90 times. The first level of colour coding was introduced to show usage levels $\pm 50\%$ from the average of 100 with further levels at -75% , $+100\%$ and $+300\%$. This scheme of coding helped to show, at a glance, the relative levels of use and was used in this way throughout the study.

There is no clear pattern in terms of library lending by broad subject area and this was the only one of the services shown in Table 2 that had a multiple of less than 10 between the lowest and highest users. The use of IT services tends to be lower in the Arts and Humanities subjects, and higher in the Sciences. The higher demands placed on University resources by science students are recognised by HEFCE through a higher level of funding – as shown in the HEFCE weight column.

In order to develop a suitable costing model it is important to understand the reasons behind these variations. To complete the picture, additional information from central sources was collected on School finances and space utilisation. The additional information revealed the extent of School contributions to complement the centrally provided services.

Table 2: Relative service usage pattern by School

Faculty / School	HEFCE weight	Library lending	e-source	e-mail	Web use	e-mail server	Home files	PC Labs
Arts & Humanities:								
Arts and Communication Design	1.5	108	30	64	64	53	98	71
Continuing Education	1	32	12	28	19	29	33	5
English and American Literature	1	154	23	45	14	30	27	83
History	1	185	73	186	14	53	44	89
Humanities	1.09	109	36	155	10	37	32	64
Linguistics & Applied Language	1	222	35	129	60	119	158	137
Modern Languages	1.5	62	7	61	18	65	42	59
Economic & Social Sciences:								
Business School	1.11	67	72	53	126	96	72	146
Institute of Education	1.5	192	10	83	61	44	45	95
Health and Social Care	1.5	70	38	38	15	34	19	15
Law	1	44	148	35	13	32	28	74
Sociology, Politics & Int. Relations	1	125	68	51	36	66	53	94
Life Sciences:								
Agriculture, Policy & Development	1.33	137	304	217	128	321	368	317
Animal & Microbial Sciences	2	76	229	183	191	211	141	102
Applied Statistics	1.5	31	50	141	130	126	130	158
Food Biosciences	2	135	307	470	248	334	193	82
Plant Sciences	2	108	284	160	184	345	229	158
Psychology	1.95	79	174	83	79	81	48	86
Science:								
Chemistry	2	59	615	183	373	254	175	36
Construction Mgmt. & Engineering	1.79	77	118	107	217	125	145	70
Human & Environmental Sciences	1.61	144	100	95	135	147	230	57
Maths, Meteorology & Physics	1.81	49	120	136	202	133	185	217
Systems Engineering	2	42	14	121	249	119	144	49

Usage key –

see discussion in 6.3 below

v. low (0-25)
Low (25-50)

Average (50-150)
High (150-200)

v. high (200-400)
v. v. high (400+)

Meetings with the head of each School, or their representative, enabled a complete picture to be compiled of information service provision in the University. Prior to the meetings information for each School was collated, as shown in Annex 1, to form the basis for discussion. The benefit of using colour coded indices can be seen in this example. Annex 2 shows the check list used to ensure that all aspects were covered. The discussions also provided an insight into the reasons for the wide range of service usage; these included: School's own library/learning resource centre/PC labs; mix of full-time and part-time students; student's own access to other resources (especially for part-time students); proportion of students on short courses; historic relationships between Schools and central services; School funding sources; the teaching / research balance; charging models for services; levels of School IT literacy/competence.

6.3 Administration and central services

As required by TRAC, the portion of costs incurred by revenue generating services, such as residences and sports facilities, is assigned directly to those activities. It is the remaining costs that are allocated by the proposed model. Information Services are used by administration and other central services of the University. IS usage by these services was examined and consideration given to the most appropriate way to allocate these costs, taking into account the following points:

- overall, the total usage of IS by these services amounted to less than 10% of the total
- TRAC does not require central costs, other than estates costs, to be allocated to other service departments
- had allocations been made to the various other departments, these costs would then have had to be re-allocated to the Schools along with the other costs of each administration/service department
- ease of allocation within existing transparency costing system.

Evaluation of various options showed that there was little benefit to be gained in going through a two-stage allocation process for considerably less than 10% of the costs being allocated. These would, in any case, be redistributed based on some model related to a combination of FTE staff and student numbers.

6.4 Recommended costing models

The wide range of services provided by the ISD precludes the use of a simple model to allocate the total cost of the Directorate. Each of the three distinct divisions within the directorate has its own cost centres. The information collected through discussion with central and School staff suggested that allocation based on this three-way division was probably not appropriate. A detailed examination led to the following decisions for allocation purposes:

- to combine the cost of archives and special collections with UMACS
- to treat PC lab costs separately from other ITS costs (telephone costs are already directly charged)
- to base allocations for the School of Continuing Education on students enrolled on certificated courses only (only these students have access to the University's IS facilities).

Other alternatives were also considered, as discussed below.

Total transparency costs for each of the four revised groups were determined and a variety of possible allocation models considered. In total, 14 main options for library costs and 12 for ITS costs, together with a number of minor adjustments, were evaluated and compared against the existing methodology.

Factors considered in the models included:

- use of headcount or FTE data
- relative weightings of staff, UG, PGT and PGR
- treatment of inter-library loans
- treatment of e-sources
- allowance for School resources used to complement the central IS provision.

One of the main considerations in the evaluation of the results from the models was the extent to which it mirrored the variety of School usage levels previously identified. In order to assist with this, the method of colour coding from the usage analysis (Table 2) was continued. Each model being matched against the usage pattern to determine the extent to which it modified or "bleached" the colour balance (see Section 6.4.2). The aim was to allocate costs in a way that would mirror usage patterns. For comparison purposes, the existing transparency model was also tested in this way.

6.4.1 Library costs

A significant proportion of university library expenditure is devoted to the purchase of new books and periodicals. In Reading a specific amount is allocated each year to each School for the purchase of books and a separate amount for the purchase of academic journals. As these costs are School specific the allocation model assigns them direct to the School, with the book budget being allocated to teaching and the journal budget to research.

Inter-library loans form a measurable but, for Reading, relatively small portion of library costs (<3%). As statistics are easily available showing usage by School, the separate allocation of these costs was evaluated but did not produce a significant benefit in terms of overall outcome. Also, the extent to which School's make use of ILLs is, partly, a reflection of the library resource traditionally allocated to a subject area. Thus, the heavier users tend to be the Schools with new subject areas or those with historically low level of library resource. Separate treatment of ILL costs should be considered when modelling library cost allocations. For more research intensive universities ILLs may well account for a more significant portion of the overall cost of information provision and warrant separate treatment. In the case of Reading, given its proximity to major information sources in London, Oxford and elsewhere the difference made by separate treatment of ILL costs was well within the margins of error inherent in any cost allocation model.

In libraries the number of registered users is said to be a better indicator of demand than a notional FTE figure. Thus, a part-time student or member of staff is likely to make as much demand on the resource as a full-time equivalent. Models compared headcount with FTE cost allocations. For Reading University there was little to choose between these two models. This is mainly due to the relatively low proportion of part-time students in the University and to the fact that the proportion of part-time staff is relatively even across the Schools. There are some exceptions to this, the most significant being the School of Continuing Education, as previously discussed.

The main driver for central cost allocation is FTE staff and FTE student numbers. This information is already collected for use in the allocation of other central costs and forms the basis for the allocation of funds by the University to each School. Also, the FTE student numbers show the teaching load by School, not the FTE of students registered with Schools. Headcount allocation, based on student registration details, distort the true usage pattern of subject material. For example, Modern Languages

provides language tuition for students across the University, and receives the corresponding funding for this; a headcount based allocation will result in a significantly lower apportionment of costs.

Use of e-source material is increasing, as are the costs to the library, as more material becomes available. However, the pattern of usage of this material is very different to the use of the physical library resource and is closer to that of the general ITS services, as shown in Table 2. These costs may be considered within those of the library, or treated separately. After evaluation, it was decided that as the usage pattern was sufficiently similar to that of ITS that these costs could be treated in the same way as the general costs for ITS.

Schools contribute, to a varying extent, their own resources for information provision in a number of ways. Many use money from their grant to purchase additional books and journals. These may either be held in the University library, or in a library/learning resource centre within the School. Holding within the School will incur additional costs for space and management. All of these costs can be identified. An examination of usage patterns reveals that Schools that have their own library type facilities tend to use the central library resource less than might have been expected. Allocation models that recognise, in some way, Schools' contributions, therefore, tend to give a closer match to usage patterns for central resources than those that do not take this into account. The most suitable model appears to be one that adjusts for the amount of Schools' direct spend on "library materials", - mainly books and periodicals. Wherever held, these materials are normally available to all members of the University and can, therefore, be considered as a general University resource. It is less easy to justify any adjustment for staff or space costs as this element of cost gives little overall benefit to the University in general. To undertake any such adjustment it is necessary to increase the total cost to be allocated by the total amount spent by Schools, and adjust the revised allocations according to the level of spending by each School.

The final cost allocation model for the library is as follows:

School books budget allocated to School (teaching)

School periodicals budget allocated to School (research)

e-sources to be included in the ITS allocation

Archives and special collections to be included with UMACS for allocation

The remainder of library costs, plus total School expenditure on library materials, to be allocated with the following weightings (see Table 1), based on FTE numbers:

UG = 1 – allocated to teaching

PGT = 1.5 – allocated to teaching

PGR = 1.5 – allocated to research

Academic staff = 0.7 – with allocation to teaching, research and other based on time analysis data.

Individual School allocations are then reduced by their spend on library materials, to maintain the School teaching/research/other proportions.

The relatively low weight given to academic staff is a general reflection of the changing nature of research and availability of research resources. Whilst the library continues to provide the means of access to these resources the actual physical presence of the library is becoming less important, in some subject areas. This is a result of the increasing availability of research material electronically and its use, in this form, by academics. Generally, academics continue to place a high value on the library and its services.

6.4.2 ITS costs

The data showed two distinct services and costs for ITS. These are: provision and maintenance of open access PCs in PC labs and other general areas and; provision of IT services such as e-mail, web access and file storage.

The telephone service for the University is provided by ITS. This service is metered and directly charged to recover costs. These costs, therefore, are already known and allocated to each School.

Running PC labs accounts for almost one fifth of total ITS costs (including space). The pattern of usage of these facilities is also very different to that of all other ITS resources. These facilities are used almost exclusively by students, the limited amount of staff use mainly being due to the use of some PC labs as a teaching resource, or to the use of open access PCs in the library.

The weightings for allocation of PC lab costs (see Table 1), based on FTE numbers, are:

UG = 1 – allocated to teaching

PGT = 1.5 – allocated to teaching

PGR = 1 – allocated to research

The lower weighting for PGR students than for PGT students is explained by the greater access to IT resources for research students in most Schools.

Central services, which are focussed on the delivery of a reliable PC based network and infrastructure, typically only provide part of the total ITS needs of Schools. Schools such as Systems Engineering and Mathematics, Meteorology & Physics clearly are much more heavily dependent on a reliable and sophisticated information infrastructure than most Schools in Arts and Humanities. Schools that are highly reliant on IT tend to be more competent in supporting IT applications and in providing IT resources to staff and students. A model, similar to that for the library, that adjusts for levels of spend from School funds can be developed. Some such adjustments over-compensate the higher technology Schools at the expense of the less technically dependent. It may be considered appropriate to adjust for School external expenditure on IT support and maintenance. In many cases, such support will ease the pressure on the central support function and the availability of central resource to support users of Apple Mac machines is very limited. As a result Schools need to provide their own support for these users.

A weighting for the allocation of other ITS costs, including e-sources, has been derived from the usage analysis (see Table 1). The appropriate levels for Reading University are:

UG = 1 – allocated to teaching

PGT = 3 – allocated to teaching

PGR = 8 – allocated to research

Academic staff = 11 – with allocation to teaching, research and other based on time analysis data.

The inclusion of e-sources within this weighting compensates for the use made by staff of this library provided resource.

The final recommended model for general IT service costs is based on the above weightings, after adjustment for School IT support and maintenance costs (as described in the library section). The final model also incorporates one further adjustment. The disparity in usage rates between Schools has already been commented upon. A fair and equitable proxy to allow for this is needed if the model is to be more robust and reflect more fairly the way in which central resources are being used. As noted earlier, HEFCE funding levels for students are subject related, with universities receiving twice as much for some science student as for arts students, and various other multiples between one and two for other students, as shown in Table 2. As School income is related to the University's income from HEFCE it is considered that the HEFCE multiple is a reasonable and justifiable proxy.

In summary, the final recommended model for ITS has two elements each with separate student/staff weightings:

- PC lab costs
- other ITS costs, including e-sources, adjusted for School spend on support and maintenance and weighted according to HEFCE subject ratios.

6.4.3 UMACS, archives and special collections costs

Usage patterns for this group of activities are less readily available than for the library and ITS. Examination of user records (physical, telephone, e-mail and web) show that Reading University members account for approximately 10 per cent of the total. The main use of this resource is for research. Managers of these services have identified the main user Schools within the University and 10 per cent of the total costs are allocated accordingly, between research and teaching. The other users include visitors to the object exhibition (mostly school parties); users of the archive, special collections and MERL reading rooms; web, e-mail and telephone enquiries. Apart from the museum visitors, most of the users are engaged in research projects, either with other academic institutions in the UK or overseas, or with other organisations, or in a private capacity. This 90 per cent is allocated to "other".

6.5 Assessment of impact of the recommended cost models

The impact of the recommended cost models can be assessed in a number of ways. It is possible to compare the new models with those currently being used and also to use the results of the new models to see how these reflect usage patterns.

6.5.1 Comparison of existing and new models

To date, the transparency allocation models for information services have been based on weightings determined by the University's Costing and Pricing Review Group. The table below compares the overall split of information services costs between teaching, research and other.

Table 3: Comparison of new and existing allocation models

	Existing models		New models		Change
	Value (£000)	%	Value (£000)	%	
Teaching	5,738	64.5	5,189	58.4	-10%
Research	2,212	24.9	2,665	30.0	+20%
Other	940	10.6	1,036	11.6	+10%
Total	8,890	100.0	8,890	100.0	

Analysis of the breakdown of teaching, research and other shows considerable variation between Schools. For teaching there is a range from -20 per cent to +22 per cent. Research varies from a change of -22 per cent to a doubling of costs for information services. The extent of the changes for some Schools is highly dependent upon the weighting ratios used for the various services.

The overall percentage change in information services cost allocation at Faculty level is summarised in the following table.

Table 4: Changes in average Faculty allocations

	Teaching	Research
Arts & Humanities	-20%	+15%
Economic & Social Sciences	-6%	-3%
Life Sciences	-6%	+17%
Science	-5%	+38%
TOTAL (from Table 3)	-10%	+20%

6.5.2 Matching of costs models to usage patterns

Table 5: Usage indices relative to cost allocations

Faculty / School	Library lending	e-source	e-mail	Web use	e-mail server	Home files	PC Labs
Arts & Humanities:							
Arts and Communication Design	119	40	81	81	66	123	71
Continuing Education	57	23	51	34	53	60	4
English and American Literature	185	58	155	50	104	95	126
History	220	161	579	43	164	138	134
Humanities	130	78	432	27	103	90	90
Linguistics and Applied Language Studies	267	47	245	114	228	302	183
Modern Languages	70	8	66	20	71	46	60
Economic & Social Sciences:							
Business School	79	154	145	342	260	196	175
Institute of Education	182	10	78	57	42	42	79
Health and Social Care	60	35	32	13	29	16	11
Law	51	412	138	51	126	111	113
Sociology, Politics & International Relations	145	155	164	118	213	170	139
Life Sciences:							
Agriculture, Policy and Development	114	194	146	86	216	248	328
Animal and Microbial Sciences	45	103	58	61	67	45	76
Applied Statistics	31	34	90	83	80	82	148
Food Biosciences	101	94	102	54	72	42	57
Plant Sciences	73	109	44	50	94	63	115
Psychology	84	146	51	48	49	30	66
Science:							
Chemistry	26	226	48	97	66	46	27
Construction Management and Engineering	76	88	63	127	73	85	52
Human and Environmental Sciences	144	95	80	114	124	194	52
Mathematics, Meteorology and Physics	38	67	59	87	57	80	177
Systems Engineering	44	11	68	140	67	81	37

Key to adjusted "usage" –
moderated by cost allocation

v. low
low

average
high

v. high
v. v. high

The recommended model produces a cost allocation, by type of information service, to each School. The allocations by service can be converted into a per student index for each School. The derived indices can be used to adjust the usage patterns shown in Table 2. The aim of the model is to give a higher allocation to Schools with higher usage. Dividing the usage index by the allocation index would therefore reduce the usage index. The success of a model can be seen by the extent to which it has bleached the usage pattern shown in Table 2 – this is shown in Table 5, above.

A more complex allocation models based on the usage patterns shown in Table 2 could be developed which would produce a greater amount of bleaching. Without a greater breakdown of costs between each of the services it would be difficult to remove all colour from the table. Such a model would also be heavily reliant upon the measurable usage data and in no way directly related to the student and staff numbers in a School – making the relationship to different activities difficult. Thus a total cost allocation by School could be derived, but the sub-division into teaching, research and other would be difficult. An approach of this type would also require a detailed collection and analysis of usage data each year, which would be both time consuming and costly. It would also be less enduring, requiring revision from one year to the next.

Because each course and research project places different demands on the information services and the teaching / research balance varies from School to School no FTE based model will achieve a complete “bleaching” of the usage pattern table.

6.6 Other findings

At the outset, one of the objectives was to identify financial or non-financial benefits arising from the study.

One of the main benefits of the study was the compilation of a complete analysis of the availability of IS resources throughout the University. The results show that in addition to the £8.9 million cost of centrally provided information services the University is spending a further £3 million, through School funds and space costs on providing information services for students and staff. The overall annual cost of information services to the University is, therefore, some £12 million, which is equivalent to almost £1,100 per FTE student, or just under 9 per cent of total income.

The previous table shows one possible management benefit from the study. It helps to portray the areas of high demand and also areas that are possibly under resourced, causing low usage. Examination of these usage patterns is expected to help in future developments of the service to match availability and resource more closely to need.

Availability of cost data is clearly important to the success of any project of this type. This study has helped to highlight possible changes to the grouping and analysis of costs that could improve the quality of transparency modelling in future years. These changes are, of course, specific to Reading University but this is an area that other universities should examine when trying to model IS costs.

Reading is very fortunate in being able to categorise its IT use by user type and School. Greater availability of library usage data may have enabled an improvement in the allocation model for library costs. In particular library access control, photocopier and printing data by user type and School would help to provide a better understanding of how the library is used and by whom. Also, greater detail on the users of MERL, the archives and special collections would improve the robustness of cost allocations for these services.

The unexpectedly low use of the library buildings by academics reflects the growth in availability of e-sources. By contrast, total use of the library buildings by students has grown by almost 18 per cent in the five years since 1998/99 despite student numbers growing by less than 2½ per cent. In order to give students improved access to e-sources a number of open access PCs and PC labs have been established in the library. Plans are being developed to provide further enhancements to student services available in the central library. This will increase the variety of use that the students make of the library building.

The models for allocation of costs to teaching and research enable costs to be determined for research time, using the staff time analysis data. Teaching and research costs for Schools for both the Library Service and ITS are built up from allocations of cost based on student FTE and academic FTE time subdivided between teaching, research and other. Using this information it is possible to determine a

£/FTE (academic staff and PGR student) research cost, by School, for Information Services in total, or separately for Library Services and ITS, for use on project costing forms, as required. This is in line with the TRAC III (section B1.5) recommendation for allocation of IT costs in one of three ways: directly; through the estates charge; in the indirect cost rate. Such allocation is based on existing cost levels and, whilst giving a picture of the historic costs of various activities, does not differentiate between fixed and variable costs. For example, a 10 per cent increase in teaching or research activity will not, necessarily, translate directly into a corresponding increase in information service costs. In certain circumstances a general time based cost for specific, information intensive, projects could underestimate the cost increment. Annex 3 shows the relative costs, by School, of IS provision for FTE staff and students for both teaching and research.

Specialist IT research facilities used specifically for a project will be directly allocated, as required by TRAC. However, the provision of the generic IT services (networks, common systems and support) are less easy to allocate directly to an individual project, other than through the use of an FTE related cost, which this allocation methodology supports. For this reason the use of detailed project based costing for general information services is not proposed, at present.

National data on HEIs library and IT services, available from SCONUL and UCISA respectively, enables comparison of broad performance measures with peer institutions. These statistics provide valuable information for the benchmarking of information services, but may require adjustment to allow for variations in service definitions. To be of direct value in the development of transparency allocation models a greater level of detail on the academic profile of institutions in terms of subject spread and research propensity would be required.

6.7 Future actions

In addition to the amendment to the transparency models for information systems for 2003/04, future action at Reading University arising from this study will include:

- a) Further analysis of the distribution of School versus Central IS costs. Particular action from this is expected to be a rebalancing of centrally funded technical support through a projected resourcing exercise to be undertaken by a Pro-Vice-Chancellor.
- b) Deeper consideration of the need to collect more accurate data on library and museum usage, not only in relation to teaching and research, but especially in the light of HEFCE and other access and regional initiatives.
- c) Review of IS cost centres to more accurately identify the costs of specific services.
- d) Discussion with the Arts and Humanities Research Board (AHRB), whose recent report on Support of University Museums and Galleries includes concern on transparency.

7. Contacts, links and resources

Further detail of this project can be obtained by contacting IMPS (Information Management and Policy Services) at Reading University imps@reading.ac.uk. Roger Jones, the project officer for the study can be contacted at roger.jones@imper.co.uk.

Comparative data for other universities on libraries is available from The Society of College, National and University Libraries (SCONUL) at www.sconul.ac.uk. Similar information for Information Technology Services can be obtained from University & Colleges Information Systems Association (UCISA) at www.ucisa.ac.uk. Information about the range of university museums can be found from the University Museums Group (UMG) at www.umg.org.uk.

Example of School summary information

	Teaching Load (FTE)					Student Numbers					Staff Numbers							
	UG		PGR		TOTAL	Undergrad		PGT		TOTAL	Headcount		FTE					
	UG	PGR	Other	FT	PT	FT	PT	FT	PT	FT	Academic	Tech.	Academic	Tech.				
Dept. X	143.6	14.5	25.2	4.6	187.9	139	20	159	9	11	20	17	37	216	24	3	23.6	3.0
Dept. Y	335.9	14.0	20.8	4.4	375.1	365	0	365	9	2	11	18	27	403	35	6	31.2	5.5
Dept. Z	42.4	16.8	21.8	0.2	81.2	7	0	7	14	2	16	25	30	53	17	11.5	15.0	9.6
School	521.9	45.3	67.8	9.2	644.1	511	20	531	32	15	47	63	31	672	85.5	29	77.6	25.9

Financials:				RAE 2001		School Academic Time Split:	
Income	Expenditure	Surplus	Surplus %	5*	4	Teaching	Research
1,748	1,608	140	8.0%	5	4	39.2%	58.1%
2,349	2,482	-133	-5.6%	5	5	2.7%	
1,634	1,381	253	15.5%				
5,731	5,471	260	4.5%				

← incl. £4.9k for School

	Library					ITS					Library								
	IS Spend	IS Space Allocation	Allocation	Lending	ILL	e-sources	e-mails sent	e-mails received	Web Hits	Data Download	IT Lab Hours	Mail store	Home Directory	Reference	Books	Holdings	Periodicals	Spending	
Dept. X	30,512	39,80	7,825	15,594	152	694	4,527	6,949	145,603	889	264	10,794	27,881	25	2,274	90	25	2,274	5,612
Dept. Y	63,422	368,29	20,483	23,775	644	2803	6,496	7,063	805,952	5,316	112	16,083	77,694	140	4,308	98	140	4,308	16,147
Dept. Z	30,271	24,98	13,349	6,339	236	2012	3,172	4,591	271,459	2,583	120	3,477	8,335	109	2,009	41	109	2,009	12,392
School	129,131	433,07	41,657	45,708	1,032	5,509	14,195	18,603	1,223,014	8,788	496	30,354	113,911	274	8,590	229	274	8,590	34,151

	Library					ITS					Library								
	IS Spend	IS Space Allocation	Allocation	Lending	ILL	e-sources	e-mails sent	e-mails received	Web Hits	Data Download	IT Lab Hours	Mail store	Home Directory	Reference	Books	Holdings	Periodicals	Spending	
Dept. X	93	49	60	180	82	47	99	112	56	43	117	144	182	25	2,274	90	25	2,274	5,612
Dept. Y	97	228	78	138	174	96	71	57	156	129	25	108	255	140	4,308	98	140	4,308	16,147
Dept. Z	214	71	235	169	294	317	161	172	242	290	123	107	126	109	2,009	41	109	2,009	12,392
School	115	156	92	154	162	109	91	88	137	124	64.1	118	217	28,250	229	274	274	8,590	34,151

Weighted Indices (FTE Student):

Dept. X	88	46	56	170	77	45	94	106	53	41	110	136	172
Dept. Y	91	215	74	130	164	90	67	54	147	122	23	101	240
Dept. Z	151	51	167	120	209	225	114	122	172	206	87	76	90
School	101	137	81	135	142	96	80	77	121	109	56	104	191

Indices (Student & Staff):

Dept. X	86	46	55	167	76	44	92	104	52	40	108	133	169
Dept. Y	98	231	79	139	176	97	72	58	157	131	25	109	258
Dept. Z	293	98	322	232	403	434	220	235	332	398	168	147	173
School	115	157	93	155	163	110	91	88	138	125	64	119	218

Weighted Indices (Student & Staff):

Dept. X	81	43	52	157	71	41	87	98	49	38	102	126	159
Dept. Y	92	218	75	131	166	91	68	55	148	123	24	103	243
Dept. Z	207	69	228	165	286	308	156	167	235	282	119	104	123
School	101	138	81	136	143	96	80	77	121	110	56	104	192

Notes:
 e-source contribution: £2,750
 External spend from own resources: £18k
 ITS Contact: Amy Other - IT support
Dept. X
 No ITS SLA
 ITS Contact: John Smith - Reader
 IS Facilities: 229 Reading room
Dept. Y
 ITS SLA: 50 PCs in 102, 103, G09
 ITS Contacts: Freda Brown - Sen. Lecturer
 Sally Jones - IT manager
 IS Facilities: 102, 103 Computing
 111 Library
 Librarian: Mike Bookworm
Dept. Z
 No ITS SLA
 ITS Contact: Harry Sparks - Technician
 IS Facilities: 219 Computer

School/Department:**Contact(s):****Date:**

	ITS	Library & LRC
Staff & proportion of time (by grade or name)		
Space allocation (Room nos.)		
Own network / file servers		
Own e-mail servers		
Host own website		
Departmental spend:	Internal External	Internal External (Inc. journal subs?)
Use & usefulness of ILL		
Availability & use of e-sources		
Relative use of resources by:	Staff PGR PGT UG Other	Staff PGR PGT UG Other
Extent to which need to travel to other libraries etc. (time & cost implications)		
Other: (to include use of MERL, archives & special collections)		

Continue notes overleaf

Relative Cost of Information Services

School	Teaching				Research				
	per FTE Staff (T portion)		per FTE Student (UG & PGT)		per FTE Staff (R portion)		per FTE Student (PGR)		
	Library	ITS	Library	ITS	Library	ITS	Library	ITS	
Arts & Humanities									
Arts and Communication Design	58	274	71	37	71	274	88	112	200
Continuing Education	32	207	18	18	31	208	0	0	0
English and American Literature	53	175	57	25	64	175	94	89	184
History	50	167	50	23	84	167	96	68	165
Humanities	53	186	79	36	65	186	112	113	225
Linguistics and Applied Language Studies	42	200	49	33	65	200	82	76	158
Modern Languages	56	246	92	50	74	246	129	158	287
Economic & Social Sciences									
Business School	45	222	64	36	106	222	148	74	222
Institute of Education	54	269	84	60	115	269	160	115	274
Health and Social Care	54	335	40	32	237	335	213	75	287
Law	50	175	75	34	153	175	318	120	438
Sociology, Politics & International Relations	52	244	87	40	74	244	113	92	205
Life Sciences									
Agriculture, Policy and Development	53	324	67	41	76	324	115	120	235
Animal and Microbial Sciences	58	323	65	47	167	322	266	179	444
Applied Statistics	52	258	121	80	85	258	150	150	300
Food Biosciences	59	354	60	48	80	354	131	199	330
Plant Sciences	61	367	87	63	101	367	143	167	310
Psychology	57	331	55	39	118	331	159	152	311
Science									
Chemistry	58	340	69	48	170	340	332	219	551
Construction Management & Engineering	54	321	55	43	117	321	154	133	287
Human and Environmental Sciences	52	287	57	38	112	287	164	134	298
Mathematics, Meteorology and Physics	51	301	60	46	143	301	236	167	403
Systems Engineering	55	346	55	42	125	346	134	123	257
University Average	52	262	61	39	110	293	164	138	302

Average total cost for Information Services per taught FTE student = 100

N.B. Staff costs for ITS are the same for both Teaching and Research as the staff cost for ITS provision is apportioned to T & R according to the time analysis. There is no means, through the usage data, of applying separate weightings for T & R.

List of abbreviations and terminology used

AHRB	Arts and Humanities Research Board
ATHENS	The JISC funded management system for access to numerous web-based services throughout the UK and overseas.
e-source(s)	Academic journals and references material available electronically (mainly on-line through ATHENS or OCLC FirstSearch)
FTE	Full time equivalent Student FTE numbers record teaching load by School
HEFCE	Higher Education Funding Council for England
HEIs	Higher Education Institutions
HR	Human resources
ILL	Inter-library loan
IS	Information services
ISD	Information Services Directorate
IT	Information technology
ITS	Information Technology Services
JCPSPG	Joint Costing and Pricing Steering Group
JISC	Joint Information Systems Committee
MERL	Museum of English Rural Life
OCLC	Worldwide library cooperative for information access
PC	Personal computer
PGR	Research post-graduate
PGT	Taught post-graduate
SCONUL	Society of College, National & University Libraries
TRAC III	Transparent approach to costing – Volume III
UCISA	Universities & Colleges Information Systems Association
UG	Undergraduate
UMACS	University Museums and Collections Service
UMG	University Museums Group