Research Reports

Accounting practice and networked services: A review of UK universities

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Background

This report presents the results of a project funded by LIRG and Elsevier to explore accounting practice and networks in UK universities. The initial fieldwork was undertaken at an opportune moment (March, 1994). It followed the publication of several studies which explored research information in general and prepared the ground for a project on networked services[1,2,3]. The fieldwork also post-dated some significant developments in national infrastructure: the reorganization of the funding councils in April 1993, the dismantling of the Computer Board, the formation of the Joint Information Services Committee and its systems sub-committee, the formulation of a UK datasets policy, the acquisition of large datasets by CHEST, and the implementation of the Bath (University) Information and Data Service, which offers a block resource model that combines the simplicity of subscription (compatible with existing accounting practice) with free access at point of use[4].

The project had two phases: preliminary fieldwork consisted of interviews with computer service staff in universities in Edinburgh and Glasgow; with librarians in Edinburgh, Southampton, Newcastle and Southampton, and with researchers in London, Bath and Glasgow. The interviews were semi-structured and focused on six areas; costs and charges for local area networks, costs and charges for wide area networks, auditing of network use, the management of the local infrastructure, perceptions of the national infrastructure, and economic models, guidelines and frameworks. The second phase was a postal questionnaire in July. The respondent population was based on the universities section in the World of Learning 1994,[5] and questionnaires were sent to the library and to the computer service in each listed institution (excluding individual colleges in Oxford and Cambridge and the teaching hospitals and research institutions of the London University). Sixty-five were returned, a response rate of 34%.

The questionnaire

The original request for funding proposed to cover both LANs and WANs, and to discuss a wide range of services (including fax and videotext) under "network services". The questionnaire which emerged from content analysis of the transcripts focused on wide area networks (which dominated the interviews) and on areas which were salient concerns of those interviewed in the first stage of

the project.

For the purposes of analysis, participants were asked to classify themselves under one of the following three groups, selected from Sumsion's[6] earlier survey of academic library provision:

- 1992 university (ex-polytechnics and central institutions)
- 1960-1992 university
- Pre-1960 university

These were labelled Group A, B and C. As the percentage of returns in each group varied, the numerical results have been standardized and presented as percentages. In many of the replies, respondents indicated that a cluster of choices was appropriate; these clusters are reproduced in the Tables.

Connectivity

The responses to Question 3 revealed discrepancies in network provision, with Group A connections largely restricted to JANET, and Groups B and C offering a wider portfolio which includes Internet and SuperJANET.

Table 3. To which of the following networks is your institution connected?

	A%	B%	C%
J	30	19	4
J+I	42	25	4
J+E	0	0	8
S+I	0	0	16
J+S	8	0	12
J+E+I	16	25	12
J+E+S	0	0	12
J+S+I	0	0	8
J+S+E+I	4	31	24

J=JANET
I=Internet
E=EARN
S=SuperJANET

Questions 4 and 5 showed a similar pattern of monolithic service in Group A, with computer services dominant as the agency which bears the costs of installation, maintenance and upkeep, compared with a mix of agencies (and a strong computer services presence) on the other groups:

Table 4. Who bears the cost of initial connection, installation of nodes etc?

	A%	B%	C%
CS	79	69	52
CS+IF	8	0	8
CS+ID	0	12	0
CS+ID+RG	0	0	4
CS+IF+ID	4	0	0
CS+L	4	0	0
CS+L+IF+ID+RG	4	6	4
CS+L+ID	0	13	0
Oth	0	0	16

CS=Computer services
IF=Individual faculty
ID=Individual department
RG=Research group
L=Library
Oth=Other

Table 5. Who bears the cost of maintenance/upkeep?

	A%	B%	C%
CS	87	75	76
ID	0	6	0
CS+ID	8	12	0
CS+IF	4	0	0
CS+L	0	0	4
IF+ID	0	0	4
CS+L+ID	0	6	0
CS+IF+ID+RG	0	0	4
Oth	0	0	8

CS=Computer services
ID=Individual departments
IF=Individual faculties
L=Library
RG=Research Group
Oth=Other

Question 6 provoked a large number of non-responses (or 'not relevant' responses); rationing of bandwidth is not yet necessary in many universities. Where institutions do specify allocations of bandwidth, Computer Services (alone or in conjunction with a group) is the most likely agency to be involved:

Table 6. Who decides on bandwidth?

	A%	B%	C%
CS	46	31	44
CS+G	12	0	20
CS+ID	4	0	0
G	0	0	4
NR	38	69	32

CS=Computer services
ID=Individual departments
G=Group
NR=Non-response

Question 7 caused problems with a few respondents who were not sure whether network protocols/ stacks were being discussed, or applications software. Most, however, specified which agency was responsible for what, to reveal a mixed pattern of responsibilities, with Computer Services predominant where only one agency was involved across all groups, and Group A distinguished by the lack of involvement of research groups:

Table 7. Who decided what software should be purchased?

	A%	B%	C%
CS	38	44	32
CS+COM	0	0	12
CS+ID	8	0	8
CS+ID+COM	8	0	0
CS+ID+0th	8	0	4
CS+ID+COM+Oth	`4	0	0
CS+ID+RG+Oth	4	6	0
CS+ID+RG+IR	0	6	0
COM	0	19	0
L	0	6	8
CS+L	13	6	0
CS+L+IF	8	0	4
CS+L+ID	4	0	0
CS+L+ID+RG+IR	0	6	0
CS+L+IF+ED+RG+IR	4	6	24
Oth	0	0	8

CS=Computer services
COM=Committee
ID=Individual department
IF=Individual faculty
Oth=Other
RG=Research group
IR=Individual researcher
L=Library

Network services

Question 8 revealed a fairly homogeneous spread of services accessed, with the exception of electronic document delivery, which is not a feature of services in Group A. Several institutions (across all groups) referenced World Wide Web, Gopher and other resource navigation tools under 'other':

Table 8. Which of the following services are currently accessed by your institution?*

*These percentages are not cumulative

	A%	B%	C%
OH	91	93	92
BIDS	79	93	96
E-DOCDEL	0	31	12
OPACS	87	93	96
L-COOP	54	25	60
BB	79	93	100
DOCDEL	25	50	40
IMAGE	8	31	12
E-MAIL	87	68	100
Oth	20	6	16

OH=Online host(s)
BIDS=Bath Information and Data Service
E-DOCDEL=Electronic document delivery
OPACS=Online public access catalogues
L-COOP=Library cooperative
BB=Bulletin board
DOCDEL=Document delivery
IMAGE=Image bank
E-Mail=Electronic mail

The costs of these are borne in many institutions by either the computer services group or the library, or by a mixture of fiscal centres which might include individual departments and research groups. In some institutions, these is an integrated information services or learning resource centre, which carries the costs:

Table 9. Who bears the cost of these services?

	A%	B%	C%
CS	16	0	20
CS+L	16	0	24
CS+ID	4	0	0
CS+L+ID	16	12	8
CS+L+Oth	8	0	4
CS+L+IF	4	0	0
CS+L+ID+RG	0	0	8
CS+L+IF+ID+RG	0	6	4
CS+L+IF+ID+RG+IR	0	31	4
L	20	25	8
L+ID	4	0	12
L+ID+RG	0	6	4
L+ID+IR	0	6	0
L+RG+IR	0	0	4
L+Oth	12	12	0

CS=Computer services
L=Library
ID=Individual department
Oth=Other
IF=Individual faculty
RG=Research group
IR=Individual researcher

Though almost half of the respondents dismissed Question 10 (Where charges are made what is the object?) as not relevant, those who did reply indicated that cost recovery was the primary reason for charging, with only one institution (Group C) raising income for further investment in the network, and one imposing charges in an attempt "to limit use to serious inquiry". Responses to Question 11 (Who decides what charges are appropriate?) show that the computer service and/or library are the most common sites for decisions on charging.

User groups

Historically, JANET was funded as a network exclusively dedicated to the academic community, and though SuperJANET is intended to support high-level commercial clients, it seems unlikely that the eclectic access for public and private sector which is currently sought in the US will be a feature of the United Kingdom network in the immediate future. Individual institutions, however, have allowed access to external agencies, and this section attempts to gauge how flexible, in practice, access arrangements are. Question 12 shows that provision of access to external users is more common in Group B and Group C institutions, though it cannot be said to be highly developed. The responses to Question 13 (Which of the following is allowed restricted access?) are given in brackets. In Group A institutions particularly, undergraduates may have limited access (VAX accounts rather than network IDs, for example), and external users in all groups operate under constraints:

Table 12. Which of the following has access to your network and services?

	A%	B%	C%
UG	95(46)	100(12)	84(24)
PG	100(21)	100(6)	88(20)
RA	100(17)	100(6)	88(16)
AcS	100(17)	100(6)	88(16)
AdS	92(17)	100(6)	84(24)
ExAcS	25(4)	68(18)	64(28)
GovD	4(4)	12(6)	20(20)
ComU	8(8)	18(18)	12(12)
ExIn	12(12)	25(25)	16(12)
Oth	4(4)	6(0)	12(4)

UG=Undergraduates
PG=Postgraduates
RA=Research assistants
AcS=Acadamic staff
AdS=Administrative staff
ExAcS=External academic staff
GovD=Government departments
ComU=Commercial users
ExIn-External individual users
Oth=Other

Question 14 ("Which of the following groups pays for access to your network and services?") indicates that charging is restricted to external non-academic users. (One respondent said that there should be a uniform response to this question as there are JISC guidelines).

The demand side

Question 15 revealed that most institutions (across all groups) do not carry out an audit of network services (one respondent indicated that he could not understand the question). Of those who do audit, Group A universities focus on JANET. The results in this section may be ambiguous, given that 'audit' can cover varying degrees of surveillance: under 'other', for example, one respondent revealed a very general practice of 'monitoring traffic coming in and out of the university'. Of the less than half who do audit, computer services are responsible in Groups A and C; in Group B, libraries predominate. (Responses to Question 16: 'Who is responsible for such an audit?')

Table 15. For which of the following is an audit of use carried out?

	A%	B%	C%
J	30	13	16
J+S	12	6	8
J+S+I	0	19	8
J+E	0	6	0
S+E	0	0	4
Oth	0	0	8
NR	58	56	56

J=JANET
S=SuperJANET
I=Internet
E=EARN
Oth=Other
NR=Non-response

The questions (17-18) on auditing of network services (as distinct from networks) appear to have caused less confusion in respondents, though only half of the respondents answered this section. Of these, all three groups audit most of the services offered; the library is the most commonly cited agency, though several respondents noted the use of statistics provided by external agents like BIDS or OCLC:

Table 17. For which of the following network services is an audit of use carried out?

	A%	B%	C%
OH	4	6	4
OH+B	25	37	36
B	4	6	0
OPACS	0	0	0
B+OH	4	0	4
LC+OH	4	0	0
B+LC	0	4	4
OH+B+Oth	0	6	8
OH+LC+B	4	0	0
NR	50	44	44

OH=Online hosts
B=BIDS
OPACS=Online Public Access Catalogue
LC=Library cooperative
NR=Non-response

The questions on procurement of bandwidth and services (one respondent asked if this was the same as 'allocation of bandwidth' in Question 6), and the negotiation of licenses etc (19-22) showed a mix of fiscal responsibilities. Computer services, libraries and committees act as decision makers in all areas across all groups, and this pattern is repeated for advisory services. Contracts, licenses and subscription negotiations are also dominated by computer services and libraries, most often working together, though a wider constituency (individual departments, campus-wide committees) may also be involved. (To save space, only Tables 20 and 22 are reproduced here).

Table 20. Who is responsible for procurement of bandwidth?

	A%	B%	C%
CS	25	25	40
CS+L	29	25	24
CS+L+ID+RG	0	12	0
CS+L+Oth	21	19	16
CS+L+ID+RG+IF	8	0	0
CS+L+ID+COM	4	0	0
L	4	6	0
COM	0	0	32
All	8	6	8
NR	0	6	0

CS=Computer services
L=Library
ID=Individual department
RG=Research group
IF=Individual faculty
Oth=Other
All=All of the categories
NR=Non-response

Table 22. Who negotiates the contracts, licenses, subscriptions?

	A%	B%	C%
CS	17	31	20
L	4 ·	6	12
CS+L	17	37	24
CS+L+ID	8	13	4
CS+L+IRG	0	0	4
CS+L+IF+ID	4	6	0
L+RG	0	0	4
CS+L+ID+RG+COM	12	6	4
C+0	4	0	12
NR	16	0	0

CS=Computer services
L=Library
ID=Individual department
IF=Individual faculty
RG=Research group
COM=Committee
NR=Non-response

The supply side

The questions in this section were intended to explore the university as a primary producer of networked information, and assess the likely use of the network to offer innovative products. Only a small number in Groups B and C were hosting data or text archives, or image banks. The author suspects that the recipients of the questionnaire (computer service managers and librarians) may not be aware of 'publisher' activity at the level of the individual department, where moderators of listservs may be active. A follow-up survey of network activity in academic departments may be required.

Strategic planning

Lack of strategic planning has been highlighted as one of the defects of UK academic network provision[7]. The questions in this section indicate that all groups now provide for this activity, with varying degrees of participation from computer services, libraries, committees (the most common agencies), and departments, faculties and research groups. The most common time frames for planning are three to five years.

Table 25. Who is involved in strategic planning for network services in your institution?

	A%	B%	C%
CS	12	19	4
COM	12	6	16
CS+COM	25	31	12
CS+L	0	0	8
CS+L+COM	21	25	32
CS+L+IF+ID	0	0	12
CS+L+IF+ID+RG+COM	0	6	0
CS+L+ID+COM	8	0	0
Oth	13	0	16

CS=Computer services
COM=Committee
L=Library
IF=Individual faculty
ID=Individual department
RG=Research group
Oth=Other
NR=Non-response

Question 27 attempted to elicit what problems might inhibit participants from accounting for network services; the mix of responses highlighted 'lack of information' and 'sheer volume of information/traffic' as major concerns:

Table 27. Which of the following might be problematic in accounting for network services across your institution?

	A%	B%	C%
CAP	4	6	4
CFC	4	0	0
LInf	13	31	36
CAP+CFC	8	0	0
CFC+LInf	0	0	12
CAP+LInf+CFC	12	6	16
Oth	0	0	20
NR	50	38	4

CAP=Current accounting practice
CFC=Current fiscal centres
LInf=Lack of key information
Oth=Other
NR=Non-response

Staffing

Fiscal decision-making in the library sector falls into two categories: payroll and non-payroll resource allocation[7]. Questions 28-30 attempted to establish the financial costs and benefits of staff involved in network activity. One respondent queried the relevance of the questions to the issue of networking; and several had problems with the question 29 ('Which of the following incurs costs under expenditure for staff training?') One respondent could not answer the question on "training for others" (an attempt by the author to establish where there are marketable skills) as he did not know what 'other' meant. In all three questions, online searching, applications software and Internet dominate, and the patterns of distribution are similar across Groups A, B and C. To save space, only Table 28 is reproduced here:

Table 28. In which of the following areas does your institution provide training for staff?

	A%	B%	C%
OnSe	62	75	88
FoDa	12	44	40
CuSo	8	12	32
PrWr	0	24	20
ApSo	79	62	28
I	50	81	88
TE	4	18	8
WrDo	16	24	24
Oth	4	12	8
NR	16	12	4

OnSe=Online Searching
FoDa=Formatting data
CuSo=Customizing software
PrWr=Proposal writing
ApSo=Applications software
I-Internet
TE=Technology evaluation
WrDo=Writing documentation
Oth=Other
NR=Non-response

Economic models

Question 31 attempted to establish to what extent formal economic models are used in network planning; the answer is, apparently, not much, and less so in Group A than Groups B and C:

Table 31. Which of the following techniques have been used in your institution to assess the value of networks?

	A%	B%	C%
DiCo	12	25	12
SuCo	8	0	4
WPA	4	0	12
CBA	12	6	4
Oth	0	0	8
NR	79	69	72

DiCo=Direct costing
SuCo=Substitution costs
WPA=Work profile analysis
CBA=Cost benefit analysis
Oth=Other
NR=Non-response

Conclusions

Question 32 invited open comments from respondents. The comments of one observer: "As always with questionnaires, it is difficult to respond accurately", were echoed by others; at the level of response to specific questions, most solved the problem of a reduced choice set by glossing. The questionnaire seems to have fallen between two stools: too general to answer in a 'dispersed' accounting environment and too specific in its attempts to pinpoint fiscal responsibilities for a converged service. It provoked strong reactions in several respondents: "Accounting for network services is not a high priority; making services available and training is". Two offered savage indictments of the project. One was a Group C respondent who appeared to interpret questions aimed at a range of institutions at different stages of network development as evidence of a misunderstanding of the system as perceived from the standpoint of a well-established and well-endowed network service: "The worst questionnaire so far this year ... ignores most nationally funded networked services; ignores existence of converged services". The author, in her own defence, would like to point out that she did reference BIDS in several of the questions, and intended that other nationally funded services should be addressed in the 'Other' category of the relevant questions (as, indeed, proved to be the case in most responses). A similar assumption was made in questions dealing with fiscal decision-making, where most respondents indicated converged service by ticking 'Other' with an explanatory gloss: "we have an integrated service with network and library as one function, and we have no computer service as such ... willing to have another go at this if some of the questions could be made more applicable to a model of service integration".

Some respondents indicated that the questionnaire was, in a sense, premature: "The network has grown organically - there is not yet a strategic plan or adequate accounting tools" ... "Internet/ SuperJANET charging is inevitable - currently there would not be practical (accurate) ways of re-

charging" ... "We are currently looking at resource allocation models which may well include networking costs".

Imperfections apart, the survey has revealed diverse patterns of service provision and fiscal responsibility in the three different groups (1992, 1961-1992, pre-1961). It may be that networking in the "university sector" cannot be explored with one instrument. Just as the world of management is often researched in separate categories of small, medium and large enterprises, separate probes may be required to explore accounting practice and networking in Groups A, B and C.

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Quality assurance at St Francis Xavier Sixth Form College Library

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The following article is based on Krista's work which was awarded the TC Farries/LIRG Undergraduate Prize.

Introduction

This article outlines the work undertaken between September 1992 and May 1993 when I carried out the research to set up a full Quality Assurance programme to be implemented within St Francis Xavier College (SFX) Library. Guidelines for a college-wide programme were being drawn up as I began and it was expected that my work would fit in with these. This article describes the background to the work, an analysis of the key issues of quality assurance, and a description of our resultant methodology. In conclusion the article makes recommendations on how to develop