

Professors and Professionals: on Changing Boundaries

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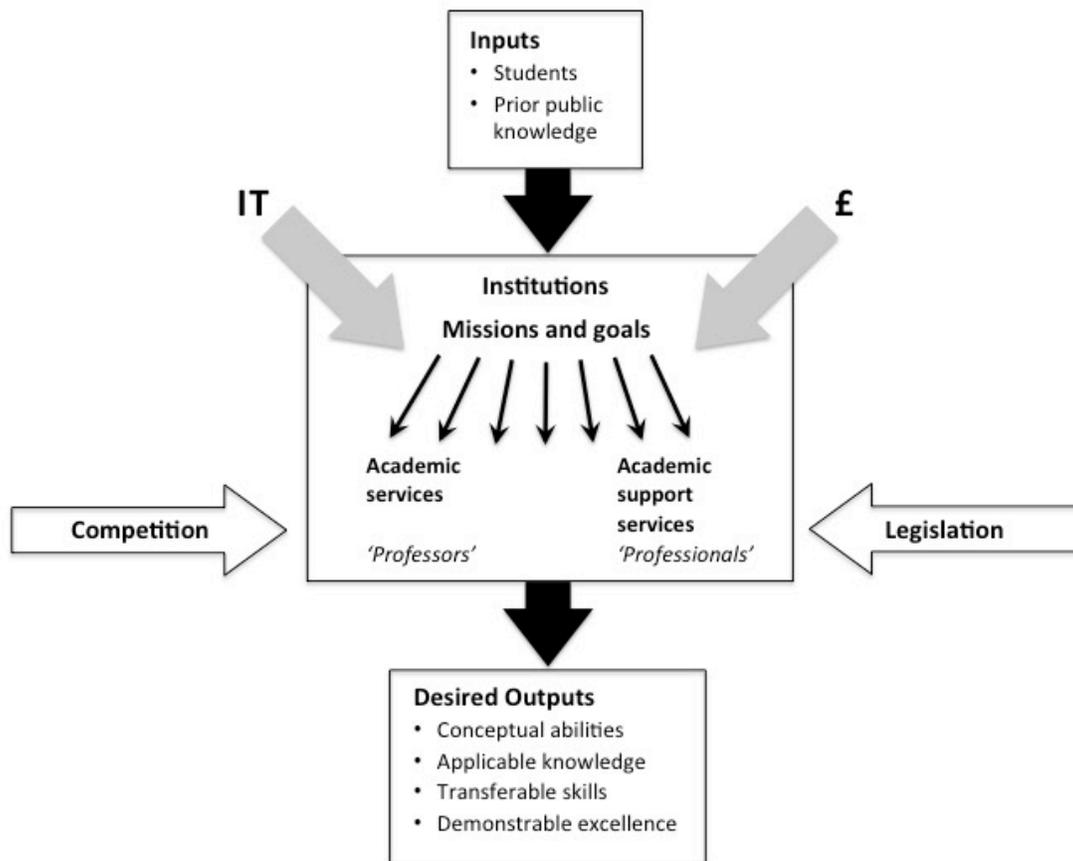
Introduction

Academic support services are essential to the business of higher education – not quite a legal requirement, but very unlikely to be dropped entirely. However, the scale and scope of their operation has always been open to question, and never more so than at present, when trends elsewhere are towards downsizing, delayering and decentralizing specialist corporate functions, that are often viewed as value-adding services by those involved but as burdensome overheads by their supposed beneficiaries. Professional ‘support staff’ – a description that seems self-contradictory to the uninitiated – have an uneasy relationship with their academic colleagues, which veers from critical dependence to indifference or resentment, according to their perspective. At best, academics acknowledge their importance and accept their existence but are reluctant to pay for their upkeep. More often, they see them as underachieving, overpaid supernumeraries, whose jobs are part of an unnecessary bureaucracy and prime candidates for replacement by smart machines.

The professors are right to ask questions, but such debates are seldom conducted in constructive terms, or at the strategic level. There are all sorts of anomalies, a common example being the apparent disparities in grading and status of different professional groups. (It is not uncommon, for instance, for library staff holding both first and higher degrees in addition to professional qualifications to be appointed on clerical grades, while their administrative and computing counterparts with less practical experience and fewer formal credentials are on academic-related scales.) This is an important issue for those directly concerned, but there are more fundamental questions requiring consideration, which will in turn illuminate other areas. Key issues include: what these support services actually or potentially contribute to academic activities; how information technology will affect future development and competitive positioning; and whether there can be a generic model for service provision, resource allocation and institutional planning.

We pursue these issues with specific reference to information services, from the perspective of library and computing service directors. We shall not explore directly the activities of other professional groups, but we think our argument will have relevance and resonance for other specialists/administrators. Our particular area of focus will be the blurring of boundaries and convergence of interests and activities between 'professionals' and 'professors'.

Figure 1 The working environment



Environmental imperatives

Our starting point is the institutional environment in which academic support services are currently provided. Our model (Figure 1) shows the primary inputs as students and prior public knowledge, and suggests that the desired outputs can be broadly categorized as applicable knowledge, conceptual abilities, transferable skills and demonstrable excellence. The inputs include a mix of student types (undergraduate, postgraduate taught and research, post-experience, full-time and part-time, sandwich, distance learners etc). The outputs relate to both teaching/learning and

scholarship/research processes, and will be manifested to differing degrees in the people who leave or stay in the institution and also as publications or other artefacts. These desiderata have been influenced significantly by shifts in thinking about the nature and purpose of higher education and the importance of teaching and research assessments as indicators of excellence.

We see the activities of higher education institutions grouped under two general headings of academic services (provided by ‘professors’) and academic support services (provided by ‘professionals’) with their particular shape determined by the distinctive mission, goals and priorities of each institution. The former is a convenient label for not only those formally titled ‘professor’, but also readers, lecturers and other academic members of the institution; the latter covers here almost everything else that supports academic activities, from administration to estate management, although we shall take libraries and computing services as our primary examples. The blurring of boundaries among the different services and the nature of the para-academic role at the centre of this model are the key areas for exploration. Such issues have been the subject of discussion over a lengthy period – several decades, in the case of the academic nature of support services – but the situation currently facing us is in many ways so different that a fresh perspective is needed to tease out the fundamental questions.

The environmental influences on higher education at present are well known and need not be documented here in detail. Institutions are under continuing pressures from government to prove their worth, in a climate of public expenditure cuts, a weak national economy, a legislative environment increasingly affected by European developments, competition on a global scale, the empowerment of the consumer or customer through the quality movement (and Citizen’s Charter) and assumptions about massive improvements in efficiency and effectiveness through the application of information technology (IT) – and business process re-engineering. The change from an elitist tradition to a mass market for higher education but with much more selective funding for research, and the prospect of similarly divisive outcomes from teaching assessment exercises, have thrown the whole system into turmoil, but we can anticipate a gradual shake-out over the next few years which will return us to a stratified system – perhaps not so very different from what preceded the removal of the binary line.

The economic and electronic imperatives are the significant driving forces. Economic pressures have been with us for a long time, and IT has also been heralded as a potential transformer of organizations for decades, but developments within the past few years (especially advances in networking) have brought us to the point where the forecast revolutionary changes in working practices are actually happening. Libraries and computer centres are among the most visible examples of services transformed by technology, but they have not been immune to other environmental factors. Indeed, the primary impetus for the Joint Funding Councils Libraries Review Group (1993) chaired by Professor Sir Brian Follett was concern about capacity – particularly physical capacity – to cope with growth in undergraduate student

numbers. A detailed account of these environmental forces and their implications is beyond the scope of this chapter; the issues have been fully discussed and documented elsewhere, both in the context of the Follett review and more generally (e.g. Corral, 1995).

Service assumptions

Before we consider the roles and relationships of ‘professors’ and ‘professionals’ in this context, it is pertinent to briefly remind readers what library and computer services have traditionally contributed to academic work. The traditional university library service has, in recent years at least, taken the form of a centrally managed facility (though often delivered through more than one service point, e.g. site/branch libraries). Standard offerings include: study facilities; general reference collections and subject-oriented collections of books, journals and reference works; lending services, including short loan arrangements for material in high demand and inter-library loans for ‘non-core’ items; photocopying services or facilities; and enquiry points. These basic services are generally supported and supplemented by various activities and additional offerings, such as online catalogues, printed guides to services and resources, instruction to users in various forms, information services (including current awareness) and access to personal computing facilities.

User perceptions and preferences have inevitably varied, but they have tended to place higher value on the collections and related facilities and been less likely to demand or defend investment in the value-added services in which professional staff take particular pride, although the latter have often been appreciated by recipients, especially students. A significant trend in library provision has been the shift from a ‘holdings’ to an ‘access’ strategy, generally linked with developments in IT and electronic publishing, and often associated with stronger management to cope with economic constraints (Corral, 1993). Copyright, which has long been a difficult issue with printed publications, has proved even more troublesome in the electronic environment, involving library staff and users in complex licensing and leasing arrangements, often requiring negotiation on a title-by-title basis.

On the computing side, there has been a similar scepticism about professional services beyond the basic job of getting the equipment installed and operational, although academics have been more ready to acknowledge the technical complexity of the work involved and accept the need for professional specialists. The historical model of central mainframe services, with specialist operators carrying out jobs for departmental users, long ago gave way to the now familiar decentralized pattern, but where a need for specialist help with applications was identified, this tended to be met by employing programmers in departments (which suggests a significantly different user view of library and computing support).

As the decentralization of processing power to the desktop has continued, this has reinforced the academic view that all they want from a central service is an

infrastructure that works, with a minimal number of (expensive) professional intermediaries. Computing services have thus often had a hard time convincing colleagues of the benefits of providing central support services such as help-desks, and even more difficulty arguing the need for higher-level staff in planning and developing – as opposed to running and maintaining – the network infrastructure, which is assumed to require little expertise. As with libraries, students have shown more interest in the central services available; indeed, as the PC revolution has progressed, student demand for help has grown in parallel with academic disdain, creating tensions and strains within the system.

Just as ‘quality’ has become the buzzword of higher education generally, ‘convergence’ has emerged as the big organizational and political question for library and computing services in particular. The Follett and Fielden reports (Joint Funding Councils Libraries Review Group, 1993; John Fielden Consultancy, 1993) have given further impetus to such discussions, with Fielden especially assuming the trend of library and ‘information/computing’ services coming closer together will continue and become ‘universal in some functions’ (John Fielden Consultancy, 1993: 22). Fielden’s contribution to the debate is notable for drawing a distinction between ‘organizational or formal convergence’ and ‘operational or informal convergence’. The report also predicts and defines ‘a new form of convergence . . . “academic convergence” through learner support’ (John Fielden Consultancy, 1993: 24), and raises some pertinent questions about the staffing and skills implications of such developments. However, the picture offered is both short-sighted and incomplete; it is constrained by the time boundaries set by Follett (the review’s limited planning horizon and the timetable for the report’s completion) and it concentrates on support for students with rather superficial treatment of support for research.

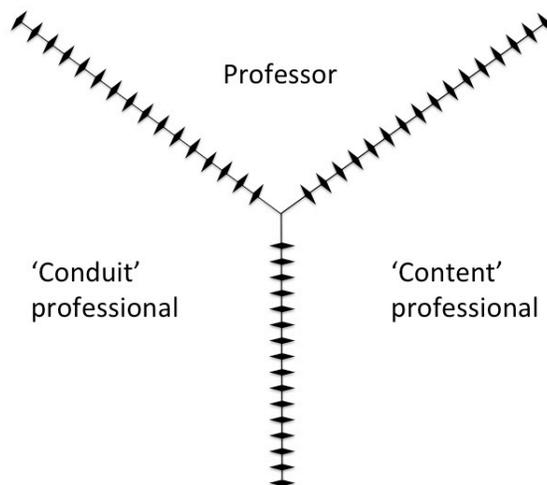
Boundary disputes

Our model here is more complex than Fielden’s, as it explores the shifting boundaries between academics and library/computing professionals along several dimensions, in relation to both teaching and research, and in the context of short-term as well as longer term changes.

Our first point of departure is to argue the need for a tripartite view, where we identify three types of player, broadly categorized as the ‘professor’ (a person appointed on the basis of his or her academic specialism) and two species of professionals: the ‘content’ professional (whose particular expertise is in the organization of information, the data) and the ‘conduit’ professional (an expert in the technology itself) (see Figure 2). The professionals can be approximately equated with the traditional library and computing specialisms respectively, but to label them thus is to ignore shifts that are already taking place, and it is more appropriate to think in terms of ‘information specialist’ and ‘IT specialist’ without presupposing them as defined by possession of particular sets of professional/technical qualifications, or

knowledge and skills. Despite growing support for the notion that there are so many common job elements among library and computing personnel that the distinctions are almost trivial (e.g. Woodsworth *et al.*, 1992), we believe that this is a valid and useful classification, while acknowledging that some professionals may combine competencies from both areas.

Figure 2 The three players

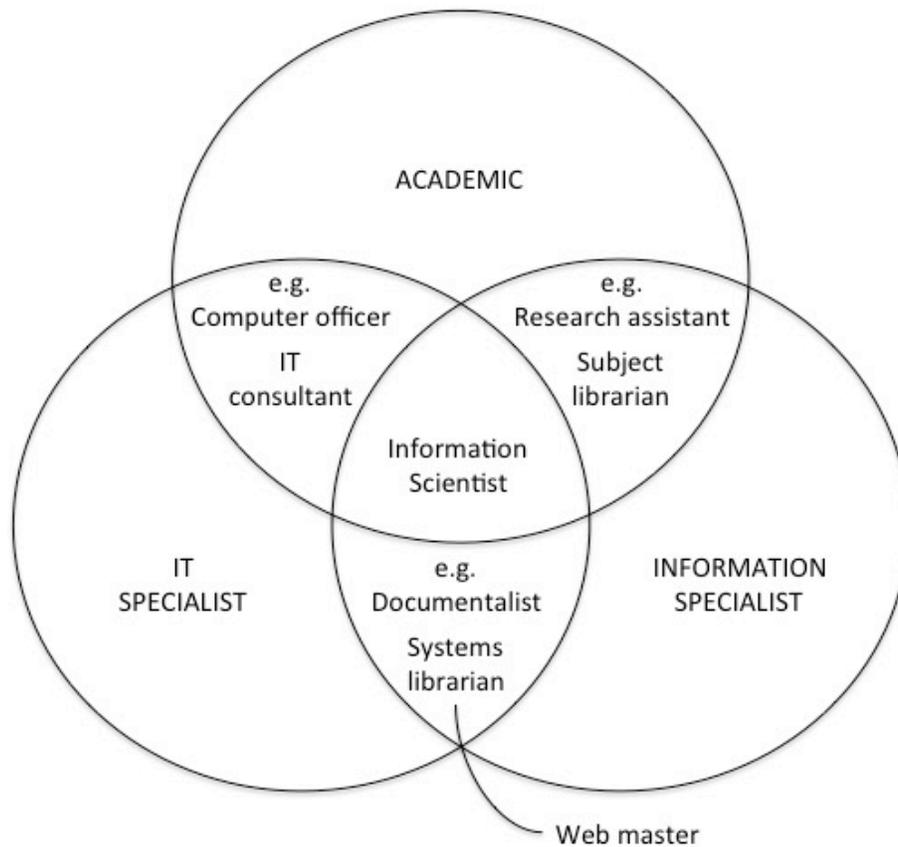


The complexities of the model emerge as we consider the blurring of boundaries between these three types of players, represented by eight examples of ‘hybrid’ professionals. For convenience, we have given these examples labels reflecting some roles undertaken or titles used in universities in the past and present (see Figure 3).

On the boundary between the academic and information specialist, we have identified not only the traditional subject librarian (Fielden’s candidate for an enhanced para-academic role) but also the research assistant, who approaches the border from the other direction and works from a departmental base.

The *subject (site) librarian* will probably have a formal qualification in librarianship and possibly a degree in a relevant academic discipline; he or she will certainly acknowledge a responsibility to have an understanding of the structure of the literature in the chosen field, and some grasp of its terminology and concepts. This job typically involves advising on the selection of books and other information resources to support teaching and research, providing user education or information skills seminars (especially for undergraduates) and answering subject-related enquiries, including helping users to search CD-ROM or online databases. The postholder may be based at a reference desk in the part of the library where materials on the specialism are concentrated, or at a separate departmental or faculty library; in either case, liaison with the relevant academic staff will be an important aspect of the job.

Figure 3 Some specialist roles



The extent to which an academic dimension of the post is explicitly defined will vary; in the former polytechnics, the title tutor librarian was often used to signal the teaching role associated with instructing students in the use of the library and its stock; in the older university research libraries, it was not uncommon for subject librarians to pursue their own research interests (for example, compilation of scholarly bibliographies) alongside their work in supporting library users. It has never been entirely clear on what basis such posts claim to be ‘academic-related’, not least because in practice the numbers of genuine subject specialists (as opposed to information specialists) have tended to be relatively low if we use an academic qualification in the subject as one of the criteria. On the other hand, there are examples of information specialists who have managed to integrate their information skills work with academic programmes by organizing their inputs to coincide with specific student assignments and delivering them in tandem with academic colleagues; in some cases, library staff have helped to shape changes in teaching methods and course contents, by, for example, alerting academics to opportunities for project work presented by new electronic information sources.

Current opinion on the subject/information librarian role is confused. Fielden argues against academic-related conditions of service (because he favours a single integrated grading system for professionally qualified and other library staff), but he sees the para-academic role of learner support as critical to future success, and recommends formal agreement of the boundaries of responsibility with relevant academic staff. Heseltine (1995) has strongly criticized 'the whole concept of subject librarianship', but he supports the development among library staff of 'a much wider range of teaching and communication skills' (in addition to network skills, technical competencies and awareness of information resources) to turn them into 'professional educators'. His model assumes wholesale convergence of all academic support services, with functional specialists (rather than subject- or faculty-based teams) and training as a prime example. He has previously argued (Heseltine, 1994) that librarians' success in imparting generic information skills is as yet unproven.

This debate has been with us for some time, and our views have not changed in essence over 15 years (Lester 1979, 1984). In principle, user education in a university library must be driven by the needs of the academic discipline, and ought to be led by academic staff – ideally carried out by the lecturers themselves, with librarians at hand to advise on more technical aspects of information organization and management if required. The whole focus should be on integrating information handling with academic course work and not teaching library or information use for its own sake or in isolation. Library and information systems should not be so difficult to use that this becomes a substantial subject for study in itself by people for whom it is not a primary concern. In practice, librarians have more often had to take the larger share of this work, as many academics have proved either unwilling or unable to do so. Ironically, although we are now working in an environment where information systems have been designed much more with the 'end-user' in mind, it will be some time before so-called 'user-friendly' systems are easy to search both efficiently and effectively. Users commonly still need help with the technology to gain access to networked services, and also professional advice on search techniques, especially for more complex searches.

The *research assistant* is a player often overlooked in the debate on the level of library support required by academic staff. This is the researcher appointed on the basis of his or her academic qualifications, probably with a fairly narrow remit within an academic department or research group, and almost certainly no explicit responsibility for information work. However, in practice, these people often fulfil such a role by conducting literature searches and seeking out relevant material for professors. While we can point to examples of academics calling on library staff to act as research assistants when they lack support within departments, experience suggests that they are more likely to seek academically qualified people (rather than information specialists) when making such departmental appointments.

Academics often question the costs and benefits (to them personally) of the library having subject/information specialists, claiming that the research support supposedly offered is an unnecessary or irrelevant luxury and arguing that the money

would be better spent on periodical subscriptions. Professional opinion is quite divided on this: although many libraries aspire to provide tailored support for both teaching and research, success in the latter area is much harder to measure, and therefore to justify (especially financially). Some libraries (notably in the United States) have introduced multilevel subject-oriented support, which ranges from basic reference queries through more in-depth enquiries to appointment-based advisory and consultancy services, which are open to both students and staff, but with the latter aimed particularly at researchers (Hammond, 1992; Massey-Burzio, 1992; Rinderknecht, 1992). Others have contented themselves with meeting and greeting new academic appointments, making them aware of facilities and resources available, and perhaps offering some current awareness or alerting based on profiles of research interests. In practice, few libraries are staffed at a level which enables them to do this systematically; provision has therefore been patchy, with the predictable effect on user experiences and reactions.

In the past, the subject/information librarian was often able to make a distinctive contribution by carrying out online searches for academics, but the upsurge in 'end-user' searching (in the library or at the desk) has dramatically reduced this role to the point where it has almost disappeared completely. It seems unlikely that the library will fulfil a substantial mediated research support role in the future, as the combination of networked self-service access and availability of research assistance within departments will obviate the need.

On the boundary between the academic and IT specialist, we have chosen the two illustrative roles of computer officer and IT consultant. Despite a longer history of separate faculty and departmental libraries, the decentralization of academic computing support in recent years (largely precipitated by the PC revolution and the networking of processing power to the desktop) has generally resulted in much reduced central computing or information systems functions during a period when libraries have tended to become consolidated as centrally managed services, albeit with distributed access. The focus of campus computing services has shifted away from computing *per se* – hence the frequent change of name to IT or information systems – to planning and management of the network infrastructure, support for shared facilities (including student PC laboratories) and a range of advisory services, which like their library counterparts emphasize training, facilitation and self-help, rather than operating equipment on users' behalf.

The type of *IT consultant* we are concerned with here on the boundary between the central service and academic departments is likely to have a significant customer-service dimension to his or her work, and the job may well be defined in terms of support for a particular department or faculty. Some university IT services have reorganized to create separate divisions for network/facilities management and user support, with the latter organized along similar lines to library liaison and subject-based activities. (In so-called converged or merged services, this is generally the area where operational convergence has come closest to fruition, with information and IT specialists working together as a team.)

The IT consultant role typically involves: advising on the choice, purchase and installation of hardware and software; providing training in IT skills (especially for undergraduates); and solving application and equipment-related problems, including helping users to access networked software and other facilities (for example, library services). The academic dimension of this sort of work is perhaps less obvious than for library counterparts, but the recent trend towards making computer literacy/IT skills modules compulsory components of degree courses has clearly strengthened that aspect. The potential overlap with library staff in both the information skills and networked resource areas can cause understandable confusion for users, who are often unsure where to go for help with day-to-day problems (for example, obtaining access and instruction in the use of services like the nationally networked Bath Information and Data Services).

The role of *departmental computer officer* is particularly associated with academic departments which have a discipline-based interest in IT (for example, computer science, electronic engineering) and a long tradition of employing their own computer people because of their specialist needs and heavy dependence on such equipment. The growing use of IT in many other subject areas, combined with the shift to distributed processing, has led to similar appointments in departments ranging from pharmaceutical sciences to business and management studies. These people often perform similar roles to the centrally based IT specialists, including advice on equipment purchases, user support and training, as well as day-to-day maintenance and trouble-shooting. The decision to invest in specialist staff at the departmental level will depend on factors such as size and physical location, degree of dependence on IT and the level of service available from the centre. However, the nature of the job tends to vary with the subject discipline, in terms of both technical complexity and academic role. Computer officers in laboratory-based departments are often expected to do a significant amount of teaching and also to carry out their own research in the subject discipline, whereas in other areas the academic-related work is more likely to be limited to IT skills training (like the computer centre staff).

Approaching the border between libraries and IT/computer services, we find the professional traditionally known as the *systems librarian*. These people will usually be professionally qualified librarians, often with a technical services background (for example, cataloguing), who have gained knowledge and skills from experience of working with library 'housekeeping' systems. However, with the new generation of library systems running on industry-standard platforms and the growth of networking and PC-based applications, this role is changing significantly and the more technically advanced libraries have seen the need to have someone capable of taking a strategic management responsibility for all IT-based systems in the library, rather than relating it too closely to technical services. The extensive and intensive use of IT by libraries, and particularly the introduction of local CD-ROM networks, has resulted in many libraries establishing a systems team, which will often include their own IT specialists (akin to academic departments' computer officers) as well as library/information specialists with an aptitude for IT.

The latest addition to this group is the new breed of network support officers, often based in the library, but recruited on the basis of either information or IT expertise. Specific examples include the *web master*, who concentrates on Internet (and Intranet) support. It is worth noting that, in some institutions, posts of this type may be completely outside the library/computing services and linked with university/public relations functions.

Coming from the other direction – but probably less common now in the days of slimmed down central units and online help facilities – there is the *documentalist*, defined here as someone in a central computing service who looks after documentation (for example, maintaining collections of software manuals and training aids). Although there are known examples of qualified information specialists fulfilling such roles, it is more common to find a non-specialist doing this job.

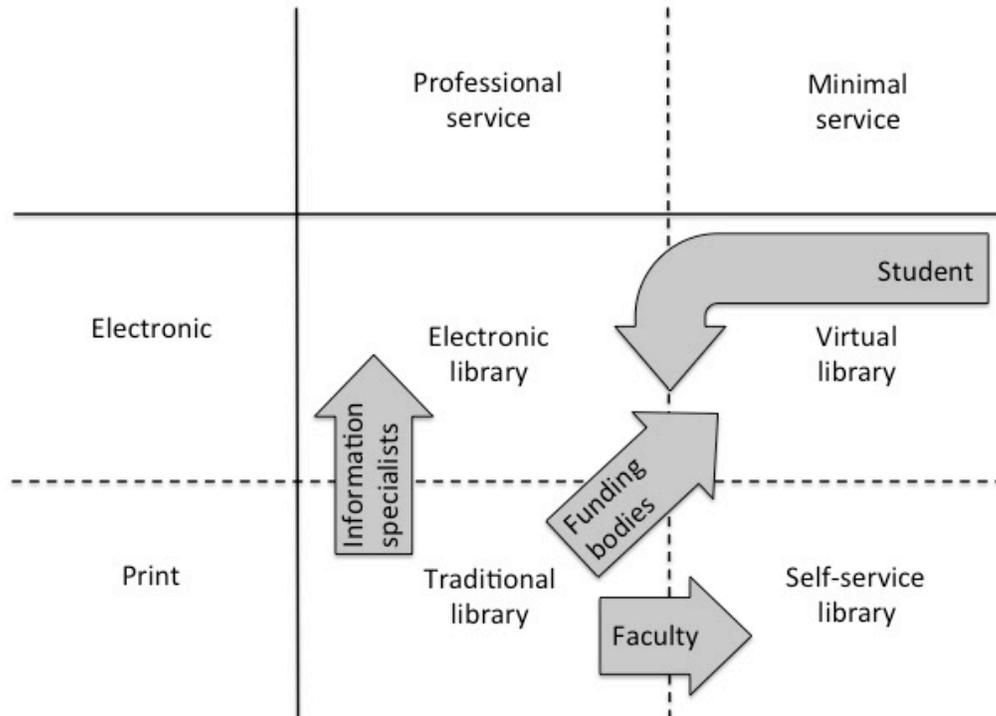
At the centre of our model sits the professional who combines information (library), IT (computing) and academic (subject) specialisms: the real *information scientist*, which is actually rather a rare breed in higher education institutions, although quite common in industrial research units. These people tend to be found in industries where specialist knowledge of the subject content is essential and IT systems are so integral to the organization of information that it is best to combine the expertise, and they are most commonly found in the pharmaceutical and chemical sectors. They clearly have a potential role to play in academic research centres, and it is interesting to speculate why such appointments have not generally been made; perhaps this is because academics have not been convinced of the benefits of such investment in the information infrastructure, for these people can generally command rather higher salaries than the typical postdoctoral appointment.

Stakeholder priorities

What will the university library of the future look like, in terms of contents, location, services and (therefore) staffing? Our model predicts a spectrum of provision, with the information resource mix varying from discipline to discipline, ranging from on-site holdings of published print materials (probably quite extensive in many humanities subjects) to local access to remote electronic data sets (likely to predominate in the hard sciences). The term electronic information sources will cover a multiplicity of different publishing media and delivery modes, as well as informal and semi-published communication. Although the ownership and copyright aspects seem intractable problems at present, these will eventually be resolved; likewise, current technical difficulties with access will be sorted out, so that the future user will not need sophisticated searching skills,

The electronic and economic imperatives will ensure a definite move away from the traditional print-based professionally staffed library. We suggest three possible scenarios, representing the preferred future of different stakeholder groups (see Figure 4).

Figure 4 Desired future states



The electronic library is the model favoured by information specialists. It involves a progressive shift from print to electronic provision, which will bring complex challenges along the way, but assumes a continuing role for large numbers of information professionals – perhaps even an enhanced ‘para-academic’ one – as expert navigators, organizers and instructors. (For example, Fielden envisages subject librarians or their future equivalents becoming more involved in assisting academic departments with both course design and the development of teaching materials.) There may be several variants on the basic professional service model: some foresee a ‘relayering’ of staff structures, with library assistants moving into an ‘upskilled’ paraprofessional role as quasi-information specialists, taking on the bulk of cataloguing and enquiry work; others forecast substantial delayering, with information and IT specialists contributing genuine value-added services, but the only other significant categories of staff being front-of-house receptionists and low-level support personnel (to restock paper copiers, printers etc). The former is in effect an evolved version of the learning resource centre model, which tends to be associated with newer universities or those with a particular focus on undergraduate education; the latter represents a more revolutionary view of the academic library as an information centre of the type more commonly found in the industrial and commercial world.

The self-service library is the model that appeals to faculty. This is the true self-service library, with minimal staffing – not the style of self-service advocated by

professionals, which requires their presence as educators, facilitators and helpers. The shift envisaged here is in effect from payroll to periodicals, with substantial staff cuts seen as the answer to the twin problems of continuing increases in both the numbers and prices of titles published. The extreme version retains a large number of serials in print format, both current issues and extensive backruns of bound volumes, including both primary and secondary literature, as well as generous purchasing of monographs and expensive reference works in hard copy. In this scenario IT supports the print library by enabling more economical and efficient housekeeping (using bought-in catalogue records, self-service requesting, issue and return of books) and more effective information provision (through better search facilities, access to other libraries' catalogues, networked services etc). It assumes that systems are relatively user-friendly and trouble-free, and the main staffing requirements will be attendants and a handful of administrators. This model is particularly favoured by research-oriented staff, but also by teaching staff who wish to redistribute the budget to allow more extensive purchasing of student textbooks and longer opening hours, but without the expense of professionally staffed service points.

The virtual library is the model favoured by our paymasters, at both national and local levels, but especially the former. The funding councils have invested heavily in the national IT infrastructure, both in the network itself (and its subsequent enhancement to SuperJANET) and in a series of initiatives and programmes intended to promote the take-up and exploitation of new technologies in the context of teaching, research and administration/support services (notable examples being the Management and Administrative Computing initiative, the Computers in Teaching Initiative, the Teaching and Learning Technology Programme and the Electronic Libraries Programme). While investment in the network infrastructure has been acknowledged as a huge success in terms of its impact and benefits, many of the initiatives have delivered considerably less than anticipated by their authors. The Electronic Libraries Programme, initiated as a result of the Follett Report, has a budget of about £15 million over three years and at the time of writing has led to around 60 projects (involving more than 90 institutions) intended to improve information delivery and to explore new methods of scholarly communication. Irrespective of the technical outcomes of the programme, the Follett initiative has already had a significant impact in highlighting problems and suggesting possible solutions offered by technology, and bringing these to the attention of key opinion formers – administrators and academics – at all levels within institutions.

Although the Follett Report acknowledges that. 'In practice, most libraries will continue to combine traditional media with electronic media for the foreseeable future, and the purely electronic or "virtual library" will be rare', and its outcomes also included substantial funding for projects supporting more traditional library activities, there is no doubt that the report is associated in most people's minds with a move towards the virtual – or at least the electronic – library. The initiative has roused hopes and fears among various constituencies, and it has put libraries under much deeper scrutiny than before. It is difficult to assess whether on balance it has won more

support for future investment locally, or reinforced polarization of views on the campus; either way, it seems clear that the ‘traditional library’ is now widely accepted as inadequate for the challenges of today and tomorrow.

How and where does the *student* fit into these scenarios? Although increasingly likely to be paying customers, students – individually and collectively – are least likely among the stakeholder groups identified to exert a direct influence on future developments. The preferred model for students is probably a mix of all four scenarios: they want the latest technology at their disposal, but also abundant supplies of recommended textbooks in the hard-copy format with which they are most familiar; they like the idea of self-service facilities (preferably around the clock) with minimal staff intervention so that they do not have to queue at issue or enquiry desks, but at the same time if they have difficulties they want to be able to get personal help from someone who really knows what he or she is doing. Inasmuch as most institutions will probably opt for a ‘mixed economy’, students will get what they want in general terms; however, with budget pressures continuing, and competition on and off the campus growing, how they fare in particular institutions will depend on who holds the balance of power. Traditionally, library staff have tried to protect and support student interests, and the attention now paid to learning support services in Teaching Quality Assessments should assist these efforts; however, the Research Assessment Exercise may begin to exert even stronger influence in the opposite direction. If institutions move significantly in the direction of devolved budgeting, we can envisage a situation where the level of service available might vary considerably from department to department, depending on how they choose to allocate funds between books and periodicals – and between salaries and other library expenditure.

A generic model?

The Follett Report confirmed the view that there is no accepted appropriate level or percentage of institutional expenditure on library services (and the same principle applies to support services generally). Although not a surprising conclusion in the current political and economic climate, this contradicts a suggestion of the last major British report on university library provision that, in order to provide facilities comparable to those in other developed countries, annual spend would need to represent ‘approximately six per cent of the total university expenditure’ (University Grants Committee, 1967). Inter-institutional comparisons tend to be fairly meaningless in this context as there is so much individual variation (for example, in the mix of academic disciplines, physical distribution of facilities, financial practice on the treatment of overheads etc).

The relative priority given to teaching/learning and research, and the nature and number of disciplines covered, must affect both the level and type of provision considered as essential or desirable, and the way that services are organized, which in consequence will reflect other management arrangements within the institution. Follett

and Fielden, while not making specific recommendations on the subject, convey a fairly strong message on the inevitability of much closer working arrangements between library and computing services. It is also interesting in this context to note the comments of Professor Follett, recorded in an interview published about two years after his report went to press, confirming a personal preference for 'flat structures, with the librarian and head of IT both reporting to the vice-chancellor, because at the end of the day, you have to have a librarian to run the library and an IT person to run IT' (Worley and Follett, 1995: 22).

The current pressures for convergence – in addition to the implicit steer from the funding councils – include anticipation of cost savings in a climate of continuing budget constraints, partly founded on assumptions about duplication of effort and overlap of service roles arising from the increased use of IT by libraries and the development of networked services. Experience has shown that many factors influence the decisions made by institutions, including: institutional size; geographical dispersion; the history, culture and range of services involved (for example, academic and administrative computing, audio-visual and educational technology services, telephony, reprographics); commitment to an 'access' strategy; penetration of networking and PCs; and the skills base of staff. More specifically, personality factors and opportunities created by departures of existing service heads (rather than a planned strategic review) are often the triggers which prompt a rethink.

Arguments in favour of convergence include: the greater flexibility offered by a combined budget; the potential for improved responsiveness through joint planning and management of services; and more effective staff deployment, with common help desks/enquiry points, joint induction and training sessions and shared academic liaison roles. Against this, critics have expressed concerns about dilution of expertise and loss of professional identity. Co-operation and teamwork among library and computing staff will clearly become even more important in the future as the technological dependence of libraries increases; in addition, as the size of central computing units decreases, their viability as separate operations must be questioned.

Ultimately, it is for each university to decide what sort of support services it requires, and how best to achieve this; professionals and professors must work together to determine needs and priorities in relation to institutional and departmental missions and objectives. As yet there is a lack of hard data on whether the quality or standard of library/information/IT services is a critical success factor in attracting either students or academic staff to higher education institutions. Academics often cite periodical subscriptions as crucial in securing the appointment of good research staff, but we think this probably applies only in extreme cases of holdings that are widely known to be very extensive (or depleted). For students, we feel that impressive IT (rather than library) facilities are more likely to represent a competitive advantage.

Conclusions

We already have virtual computer centres and the virtual library is almost with us now – and certainly a distinct possibility within our professional lifetime. Irrespective of whether a university has substantial holdings of printed materials, the electronic imperative raises important questions about distributed facilities and decentralized management. In particular, it has subjected to renewed scrutiny the roles and responsibilities of professionals engaged in academic support activities: the ‘priesthood’ of central computing staff disappeared with the demise of mainframe computing, and professional librarians are now similarly threatened. Academics have long been suspicious of the so-called academic-related nature of this work, considering that these jobs are primarily about maintaining the infrastructure. The situation has become further confused with the blurring and shifting of boundaries not only between ‘professors’ and ‘professionals’, but also among the professionals themselves.

We believe that there are sound reasons for retaining the concept of the centrally managed library and information service, which includes commitment to a corporate approach to planning and developing the IT infrastructure. For the foreseeable future (ten to fifteen years) users will still need considerable help in obtaining access to the information they need on both technical and legal/economic grounds: the British Library Working Party on Electronic Publishing listed ten different types of user support and training inputs potentially required by individuals and groups for ‘self-service’ access to electronic information systems, and also drew attention to the evolving but difficult regulatory environment facing library staff (Vickers and Martyn, 1994).

Eventually we expect many of these problems to be resolved, and even in the short to medium term some student user needs may be met via computer-mediated learner support (Levy *et al.*, 1996). In the longer term, although there will still be a need for some user support and training, this could conceivably be provided online from a remote off-site source (for example, through video-conferencing), although we still envisage this role being fulfilled by professional information specialists. However, while the totally decentralized information service may be technically feasible, economies of scale will be lost in the process unless there is some central coordination and control of site licences for both software and datasets. Moreover, there will still be crucial policy issues relating to information use, intellectual property rights and data protection that will require institutional decisions within a strategic framework.

More specifically, in the long term we predict some downsizing and layering of the professional cadre of information specialists involved in supporting particular client groups. Where this type of support is currently related to specific academic departments, in future this is more likely to be justifiable only at the level of faculties or schools, but the role will be critical. A key responsibility will be to anticipate and

manage shared interests in information access which cut across traditional subject boundaries to ensure optimum value for money from institutional investments in information resources, however this is charged and funded. While interdisciplinary research and scholarship as reflected in cross-department and cross-faculty interests in electronic journals or datasets are perhaps the most obvious example here, the same principle applies to developing strategies for managing access to software and data generated internally within the institutions.

Finally, on the question of changing boundaries, we expect the situation to remain fairly fluid among the professionals. We have already seen significant shifts within libraries, between library and computing people, and more gradual blurring of boundaries with other support staff (including those in registry, public relations and planning functions). As the electronic and economic imperatives continue to drive us towards more novel ways of working and further restructuring, the professionals will regroup and require even wider skill sets, with some becoming more specialized and others developing new combinations of skills.

But we do not subscribe to the para-academic model advocated by Fielden and others; the value of the professionals' contribution must be defined in terms of their own specialist knowledge and skills. For information and IT specialists, the core competency is in information management – in the content and conduit respectively – but we must also acknowledge that while this competency is necessary to deliver effective information services, it is not sufficient, and information workers will also need personal qualities and abilities in several other areas to offer a truly professional contribution to their institutions. The professors in turn will need competence and confidence in managing information in the electronic era, without becoming information specialists. The way forward must be on the basis of mutual respect and partnership, rather than each trying to usurp the other's role.

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