DOCUMENT RESUME

ED 411 806 IR 056 633

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TITLE Information Managers/Librarians in the Year 2006: Prophets, Princes or Poohbahs?
PUB DATE 1996-00-00
NOTE 7p.; In: Online Information 96. Proceedings of the International Online Information Meeting (20th, Olympia 2, London, England, United Kingdom, December 3-5, 1996); see IR 056 631.
PUB TYPE Reports - Descriptive (141) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Access to Information; Database Management Systems; *Delphi Technique; Foreign Countries; *Futures (of Society); *Information Management; Information Retrieval; *Information Scientists; Internet; Online Systems; *Technological Advancement; User Needs (Information)

ABSTRACT

This paper reports on an unfinished Delphi investigation of information management futures. Too often the personal aspect of information provision is overlooked in the light of the dramatic development of technology. However, behind every technological advance there is a provider whose role it is to source, organize, and disseminate the information gleaned via that technology. The Internet is an important medium, and information management needs to include this device. In addition, online data is increasingly providing an economical means of accessing large quantities of data. There is a need for reliable equipment and a new generation of electronic data technicians to make that equipment and its networking reliable. There is also a need for sound software support that allows integration of data into Internet-useable formats, incorporates the Internet itself, and communicates readily, yet can be catalogued, refined, and maintained in a client-based, easily managed way. The need for an information professional who accesses, assimilates, reformulates, and then packages information in a form to suit the end-user is essential if meaningful outcomes are to be achieved. (Author/SWC)

Information managers/librarians in the year 2006: prophets, princes or Poohbahs?

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Abstract: *This paper reports an as yet unfinished Delphi investigation of information management futures. Too often the personal aspect of information provision is overlooked in the light of the dramatic development of technology. However, behind every technological advance there is a provider whose role it is to source, organise and disseminate the information gleaned via that technology.*
While the answer to this problem will be different for everyone, some considerations are becoming increasingly important. Each has significance as we move forward. Clearly the Internet is now an important medium and information management needs to include this device. Online data is increasingly providing an economical means of accessing large quantities of data, though not necessarily such as is precisely what our individual clients require.
Perhaps the answer lies in two directions, both needing consideration. On the one hand we need reliable equipment and perhaps a new generation of electronic data technicians to make that equipment and its networking reliable. Secondly we need sound software support that allows integration of data into Internet useable formats, incorporates the Net itself and communicates readily yet is able to be catalogued, refined and maintained in a client-based, easily managed way.
In either case, the need for an information professional is still present. In fact, the need for an intermediary who accesses, assimilates, reformulates and then packages information in a form to suit the end-user is essential if meaningful outcomes are to be achieved. The alternative is chaos.

Keywords: artificial intelligence, information management, Delphi, information literacy

1. Introduction

One problem that besets the modern investigator of the information field is that of definition. What's in a name? someone once asked. But there is an important issue here. Terminology can sometimes obstruct the view and sideline effective consideration of this important issue. In the educational context one often hears of Teacher/Librarians or Media Specialists. In the more open field of business one can occasionally refer to Information Manager or Data Manager in much the same context. For the purposes of this paper, I am perhaps trying to be all things to all people (a very uncomfortable position I believe) and refer to a person whose primary task it is to collect, catalogue and disseminate information effectively from many sources to users with many needs. I will attempt most usually to refer to such a person as Information Manager, more as a means of finding common ground than as a specific statement of vocational nomenclature.

The field of information provision is a changing one. Canadian Teacher/Librarian Lucinda Lockwood put it rather succinctly just recently:

> 'WHO'S STRESSED!!??? Ha ha:>). Seriously now, it used to be (in the "good ol' days") that once a librarian knew the system (Lib. of Congress or Dewey and Sears) and the process, she had it made. Things were static, and new acquisitions required no further skills to employ them. Now, librarians have to do all of the traditional stuff, and learn new information technology, too! PLUS: she has to do her own trouble shooting; teach the patrons how to use the information (she didn't have to teach patrons how to use a book!); lobby for more money to buy more technology, as well as for traditional, print resources; apply for grants for more money . . .; then there's advocacy, wherein she has to justify her role as a professional in the school. Stress is the word for it!'

For many years her outline, though highly simplistic, was fairly accurate. Life for the information provider was simple and straightforward. The 1990s have changed all that. Today we live in an information rich world. One only has to wander around the main halls of this Meeting venue for an hour or two to be convinced that we live with a virtual information overload. More than two hours there and it becomes necessary to retire to Harrods for some peace, quiet and meditation.

Into this environment, then, the information professional is thrust. It is their responsibility to make some sense

of it, interpret it and then package it in a form which is comprehensible and valuable to the end-user. Further, in these days of financial constraint the end product also needs to be affordable. Nowhere are these constraints more of a consideration than in the field of Education.

Education is that strange animal which produces no visible profit, absorbs more money than anyone reasonably expects it to and which every new incoming government enjoys reviewing as an ideal area for cost cutting. The problem also is that it is that same animal which is the training ground, the preparation workshop for future employees and magnates alike. Their future depends on adequate training, experience and resourcing in our information rich world.

With the rapidly growing cost of technology, its attendant constantly-changing nature (how many versions of Windows have we seen in the past few years?) and the unparalleled growth of Internet resources I fear we are rapidly approaching a repeat of the Great Depression of the 1930s — this time an ***Information Depression***. Never, it seems, has the gap between the information rich and the information poor been so great; and it is getting greater all the time.

Into this environment then, the information professionals are thrust.

What is their future? Will they become redundant — rendered so by increasingly simple communications packages and the growing number of online services, tailored for other people's needs?

Will they in fact become puppets dancing to the tune of invisible technologies.

What does the future hold?

I believe there IS a place for future information professionals. I believe its importance is growing with the growth of information, with the widening gap between the haves and the have nots. I believe that role is a changing one, an evolving one but a crucial one. I feel it has a little of the prophet, the priest and the Poohbah in it. I find also that I am not alone in this. There is some considerable agreement among leading professionals, shown by the results of this recent Delphi study.

2. The task

For the present specialist the task can seem enormous. Jamie Mackenzie, in his electronic article, Libraries of the Future, summed a modern Library mission up in the following way:

'The mission of the library media program is to ensure that students and staff are effective users of ideas and information.

1. Provide intellectual access to information;
2. Provide physical access to information;
3. Provide learning experiences that encourage users to become discriminating consumers and skilled creators of information;
4. Provide leadership, instruction, and consulting assistance in the use of instructional and information technology;
5. Provide resources and activities that contribute to lifelong learning;
6. Provide a facility that functions as the information centre of the school;
7. Provide resources and learning activities that represent diversity' (Mackenzie, 1995).

The task is large and in the winter of our days can seem beyond us. New forms of data provision can at first glance seem to meet all our dreams, but in the cold light of installing the newest CD-ROM (not compatible with our existing computers) or finding that one elusive piece of information during a fruitless all-night session on the Net, the trees can indeed seem as bare as the few on a Yorkshire Moor in January.

3. The prophet

One of the more important issues facing information personnel today is their ability to predict what is likely to be needed in the future by their clients, and how such information is to be first acquired and later distributed.

In this regard the information manager of the future will have to be something of a prophet. Over the past twelve months I have been 'leading' a Delphi team to investigate information personnel futures. The insights provided by this process have been intriguing. Two aspects have made themselves abundantly clear. On the one hand information professionals of the present are facing more stress than ever before in terms of learning curves and new, additional tasks presented to them. In the face of this, however, they are for the great majority prepared to work, even actively seek, new skills, new technologies and new visions. Their concepts of the future are often quite challenging.

Here are some predictions made by the Delphi team:

- *2 years from now:* High speed broad-band Internet access producing real time movies and live camera action and video-conferencing;
- *4 years from now:* Early forms of so-called 'intelligent agents' are already in use and it is possible to imagine an 'intelligent agents kit' assembled to order by the librarian in order to create a body of knowledge for a specific purpose, and keep it updated. This would involve sampling online-resources at

intervals but would need supervision by an information expert. Such software might not quite be new technology but would support the work of information experts;

- *10 years from now:* virtual reality — virtual trips to inaccessible places with some semblance of reality. Also development of communications globally leading to immediate access and exchange with partners in other classrooms with different experiences and languages. Access to expertise and experience via realistic 'avatars' (Grey (not yet published); Hird 1996; Haycock 1996; Eisenberg (not yet published)).

If any or all of these or any other possibilities are to eventuate, it behoves the information manager of the present and even more importantly of the future to be in the box seat, prepared for the contingency, forewarned and forearmed. Indications are that current information specialists are prepared for change, prepared for the possible learning curve and in some cases already working toward new solutions and technology applications.

4. The prince

Knowledge is power, so they say, and the information managers of the future are certainly going to be responsible for a lot more information than have been their forebears. In this regard they will become information princes, ruling their kingdoms by day and, increasingly in the future, by night also. Information is already becoming a 24 hour-a-day matter (LAA is one of these).

Leadership is required — leadership in collaboration; leadership in the use of new media; knowledge of sources of information and their characteristics (Haycock 1996). Leadership is also required in the area of information selection. It is not enough in view of educational outcomes simply to place a student in front of an Internet terminal and say 'have fun'. Confusion is then the only likely outcome. Outcomes need to be planned in terms of progress along the way, situations and circumstances which will promote the required outcomes, and evaluation of progress at all stages so as to ensure the outcomes do in fact outcome.

This is not easy. It requires considerable skill on the part of the information manager in enabling the information seeker to have access to the appropriate data, to have it in a way that can be comprehended and to have it at a time when it is needed. Technology has enabled more information and made delivery of that information almost immediate. It has not however tailored that information to any particular student's specific needs. This is the important task of the informational professional.

Technology and information need to be thoroughly integrated into curriculum. Franklin Bobbitt (in Jackson 1992, p.7) spoke of curriculum as a 'series of things which children and youth must do and experience by way of developing abilities to do the things well that make up the affairs of adult life; and to be in all respects what adults should be'. The Australian School Library association guide, *Learning for the Future*, suggests that 'resource-based learning is a methodology that allows students to learn from their own confrontation with information resources'(ASLA 1994, p.3). Modern curriculum has taken early views a long way, but the fact remains that today's education relies more and more on integrated learning experiences arising from a multitude of different resources.

Among the problems facing your information prince, though, are the difficulty of controlling his or her subjects. Just when the kingdom is running along smoothly and all the king's men are happily smiling at their computer screens full of information, some laterally thinking, non-intellectually challenged individual will be certain to invent some new piece of software or demand some information not currently available and thus throw the whole realm into a ferment. In our current information world one of these subjects upgrading his software on a more or less annual basis is alone sufficient to keep the realm in something resembling constant turmoil. Your information prince, then, becomes monarch of all he surveys — a constantly changing and challenging anarchy.

5. The Poohbah

One way of challenging this state of anarchy is to become Lord High Executioner — off with their heads! However this does not make the problem go away. In the first instance there is the technology itself making demands often far beyond the specialist's 'usual' training.

> 'Give me a technician or give me death! Our school is packed to the rafters with computers and related technology. Many teachers are good trouble shooters, but our knowledge only goes so far. That's where a specialist must come in. My library clerk knows less about computers than any other staff member in the school, and the library has the greatest number of different applications! How can this happen?!! I love information technology, but glitches such as inadequate technical support will hold us back' (Lockwood 1996).

In the past, information providers trained to access material, enter it into a catalogue and then guide users to that catalogue have predominated in the field. In the more recent past many of these same people have needed to become familiar first with increasingly complex computer catalogue software, then with CD-ROMs, then with networks to integrate the two and finally with the Internet and a host of online services. To add to the troubles some face is the penchant for upgrading software at the rate of new versions almost annually. If you run two programs, upgrade each and put in place new licences for same, install them on a network of 20 computers, fine. But what happens if you run Windows NT, Win95, a library software utilising MS Access and Sequel Server, Office

95 and MS Works for client workstations, Corel Draw 6, EBSCO Magazine databases, Internet access and e-mail as well as a dozen or more CD-ROM titles and 50-plus user oriented educational softwares?

> 'I see the information specialist as a broker of sorts. With the volume of information readily available increasing rapidly, the individual information consumer will need an increasing amount of assistance to locate, evaluate and synthesise the information he/she needs. If schools shift from a content delivery to a generative curriculum model (as the vast supply of information allows), the information specialist will play a critical role in helping to design and implement the curriculum' (Hird 1996).

The Delphi team highlighted the following skills as important and needing continued attention in view of their importance.

Information delivery 10 years on; important areas:

(a) More computer and evaluating skills. 4%

(b) Client support/interaction. 16.6%

(c) Database/multimedia search/retrieval. 4%

(d) Information management, esp. teams. 12.5%

(e) Technology components. 33.3%

(f) Lobbying and Advocacy. 4%

(g) Information literacy. 12.5%

(h) Managing Change. 8.3%

(i) Internet skills. 4%

One further consideration deserves mention: the often quite considerable gap between administrative expectations and their actual financial contributions. Blowout in information supply, largely due to the advent of the information superhighway, has caused a massive shortfall in data provision at an institutional level. Faced with a superhighway, most institutional drivers are equipped only with Mini Minors! Modern educational establishments not only need heavy-hauling semi-trailers to travel this highway but they also need some means of sifting through all the goodies these trucks can bring home. Too frequently, institutional administrators very well used to the old days continue to provide only the finance for the minis but expect the delivery of a Kenworth!

Success with all these difficulties either leads to something approaching Poohbah status or a prolonged holiday — a specially equipped rest home where they hand out those lovely white canvas tee shirts with the especially long sleeves that do up at the back!

6. Some important considerations

The movement towards a high-tech future in libraries is seen by the Delphi as likely to affect in definite ways the physical plant involved in providing educational information to clients. Already we are seeing two moves of some significance. On the one hand there are a growing number of establishments being built which do not include a formal library or information centre. Rather, information is provided within teaching areas on the basis of being thus nearest and most convenient for users. Information provided in this way is obtained online from sources outside the physical establishment.

Jamie Mackenzie noted this trend, describing it as:

> 'The worst case scenario is that new technologies and electronic access to information threaten to eliminate both school "libraries" as we have known them and those who have been serving as information tellers' (Mackenzie 1995).

First round results in the Delphi suggested the following list of possible outcomes for 2006:

9. Do there need to be changes in educational structures (physical plant), organisations or educator training to cope with information delivery in 2006?

(a) Yes — schools without walls. Less as physical school, more as organisation, a combination of services. 18.7%

(b) Yes — school design, timetable, accessibility, IT facilities, resources, curriculum and delivery. 18.7%

(c) Yes — amalgamated information/technology resources. 6.25%

(d) Yes — more small group facilities, project work. 6.25%

(e) Yes — strong centralised information facilities, well funded. 6.25%

(f) Yes — different for every place. 6.25%

(g) Yes — info access to every room. 12.5%

(h) Yes — a balance between every student access and privacy important. 6.25%

(i) Yes — emphasis on long distance. 12.5%

(j) Yes — more emphasis on child centred. 6.25%

By collapsing the more closely related items into one another, the team began to focus more on the child-centred approaches involved in items (b), (d), (h) and (j). However, the values of technology in terms of assisting distance education (and thus the value of some 'libraries without walls') was not lost from view.

The initial response, showing the awareness of the 'libraries without walls' concept, reflected the fears of Mackenzie and raises the issue of control. To what extent is teaching going to be interrupted or adversely effected by access to unrestricted data — information that is not previously selected, tailored and designed for specific needs within a particular institution? In this scenario, where does the role of teacher-librarian exist? As an extra class teacher, as a roving specialist or as a member of a new curriculum entity, a new school department — 'information literacy' perhaps?

The second move being seen currently is that trend towards distance education. While this has many desirable advantages, especially for the isolated students whose geographical location makes any alternative very difficult, there is nonetheless some distinct disadvantage for a student's education where active interchange with teachers and other students does not take place. Advances in technology are allowing more and more inter-communication and there are those (Imagine 3 software developer, John Devine, for example) who are seeing a virtual reality situation where no student physically attends a school and where no teacher does so either. In this futuristic scenario, the implications for interpersonal relationships would need to be totally reconsidered.

What is perhaps needed today more than at any other time of our information history is access to the wealth of data available through a single interface, and allowing a range of search formats from the relatively simple ones needed for our children through to the complex ones required by industrial researchers and businesses.

There is a current trend in Australia to view education as resource-based. Curriculum moves currently taking place, led perhaps by the *Statements and Curriculum Profiles for Australian Schools* and their ramifications, have important consequences for educational outcomes in the future. They also are going to make considerable demands on the type and implementation of data management systems in the next few years. One commentator summed this up in the following way:

> 'Literacy issues seem also to be very closely linked. The need for students to be not only literate, but information literate be able to search, acquire, organise, interpret and present information — has never been so important as it is now' (McCausland, p.17).

Such emphasis not only on the data but also on the methods of access to the data will become increasingly important as technology continues to impact on curriculum. Workplace pressures demanding more technologically aware graduates will in turn require more active incorporation of technology, especially data access and processing, in the educative process. Integrating this learning of handling skills as well as collection results seems to form an important part of the future as spelled out in the *Profiles*.

I believe similar trends already exist in all major developed countries. Certainly the workplace pressures are very little different from country to country. With this move towards integrated curriculum, information managers are in an ideal position to promote learning experiences by providing the environment and conditions that would favour evaluation of data, its interpretation and its integration into the learning process. The information manager who offers such 'information mediating support to a team of curriculum planners is modeling the kinds information skills we hope students will acquire' (Mackenzie 1995).

7. One solution — the system

One possible solution to the various difficulties is provision of a single interface to the vast galaxy of information currently facing users. Coordinating this on an international basis is probably well beyond our wildest dreams. However, on a local basis this is possible. An integrated multimedia package would need to support the Internet fully and integrate with it. It is with this in mind that LAA has chosen the Imagine 3 software which provides an open-ended package, able to incorporate all forms of current media and organise it within a single search interface — one that is familiar to its users, one that integrates with other commonly used programs and allows seamless operations with them.

It would also need to be supported by sound knowledge and on-site technical help in terms of networking, etc. This could become a joint venture with several organisations, too small to allow budget for one person, sharing a technician.

Possibly this is the key. Costs involved in data provision are rising to unprecedented levels. Unless there is a growth in shared resources, data is quickly going to become too expensive for smaller establishments, whether educational or business. We may see considerably more of the 'haves' and 'have nots' problem, or we may see a new era of shared resources and cooperation.

8. One solution — the role

Early Delphi findings indicated an extension of library/information manager role. Suggestions covered a fair range but the trend was clear.

(a) More personally client based. 10.5%

(b) More outside resource connecting. 10.5%

(c) Environment will change, role still teaching and learning. 5.25%

(d) Names/titles may change. 5.25%

(e) Major role in distance learning. 5.25%

(f) Same as now — collaboration, leadership in new media, knowledge of sources. 21%

(g) Central. Teaching access and evaluation. 5.25%

(h) Highly technological — supervising intranets and internets. 10.5%

(i) Teaching access skills. 21%

(j) A consultant, a teacher, an information-broker, a cataloguer. 5.25%

Areas of personal service and the teaching of basic literacy skills was considered important. Over subsequent rounds this consideration became more evident as team members moved towards a consensus on a role very much like the present one (item (f)).

There *is* a future role for information professionals, whether in industry or in education. It is an increasingly important one. As information increases so too does the need for professional management of that information. Accessing, selecting and repackaging for the best use of the end-user is necessary if appropriate outcomes are to be achieved. To simply provide a user with a terminal and say 'happy hunting' is not enough to ensure anything meaningful is achieved. Technology should not control, it should be controlled. It is enormously useful but should not be permitted to become and end in its own right. We may have to become Poohbahs in the age of a new Mikado, we may have to insist on being issued with Kenworths instead of the Minis we are often given, but success is worth the effort that may be needed.

Oh what a tangled web we weave, when first we practice to perceive.

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