

Evaluation of Zetoc: An Awareness and ‘Join Up’ Service

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Executive Summary

An evaluation is reported of user responses to the zetoc service that provides access to the British Library electronic table of contents database. The evaluation was conducted in three stages in the period August 2002 to July 2003. Two questionnaire surveys and an interview programme were conducted and data gathered on the use of zetoc by over 800 users.

The results from the first questionnaire demonstrated that users value zetoc as a broad based awareness service. The most popular function was the journal alert service used by 75% of the users. About 50% of the users also made use of the facilities to search the British Library database. About 17% are ‘active’ users who are achieving a personal information management routine by using an array of zetoc facilities and integrating their use with their use of other services. The other 83% of users make limited use of zetoc. They use it primarily as a stand-alone alerting service and they do not achieve integration with other electronic services.

The second questionnaire examined the impact of changes to the zetoc service on user behaviour. Most of the changes increased the opportunities for users to move from awareness to the acquisition of full text articles. This study revealed that the new facilities were valued by the users and that the active users were beginning to use them to achieve a more integrated electronic service.

The third study was an interview study to explore how different kinds of users approached the management of information resources and how zetoc fitted into their approach. Some of the active users had a mature and

knowledgeable approach to awareness and to the use of a range of electronic resources to obtain full text articles. Some users have adopted a stable but restricted usage routine that limits the danger of information overload. Others make marginal use of zetoc alerts and are not exploiting electronic services to obtain full text articles.

Overall the evaluation confirms that users want a fully 'joined-up' electronic service. Zetoc is playing a major role as an awareness service for them and has the potential to support integrated electronic document delivery. The more active users are quickly exploiting this capability, However, the majority of users are not making as rapid progress for two reasons. First, their host institutions may not have provided them with access to the necessary range of electronic services. Secondly, the users may be operating a strategy that leads them to be unaware of resources available to them. The study shows that whilst rapid progress is being made towards the technical goal of a joined-up service, the majority of users may not be able to exploit it. To achieve that will need action at a local institutional level on a broad front to organise the relevant services and help different types of users develop information management strategies that are appropriate for each individual.

Acknowledgements

The funding for this evaluation study was provided by JISC as part of its provision for the zetoc service. The evaluation team acknowledge with gratitude the help provided by MIMAS in making the evaluation possible. They also wish to thank the many users who responded to the three phases of the evaluation. Zetoc can only be a user-centred service if the user community have a voice in stating their aspirations and reacting to the service they receive. Through their generous responses to the various stages of the evaluation they have provided many pointers to the way services like zetoc need to develop to meet the widespread aspiration for a fully joined-up electronic library service.

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1. Background: The Zetoc Service

In September 2000, the British Library, in partnership with the University of Manchester, made its Electronic Table of Contents data available to UK Higher and Further Education institutions. The Electronic Table of Contents database lists the details of approximately 20 million journal articles and conference papers. The British Library contracted Manchester Computing to develop and mount a Z39.50-compliant version of the ETOC database, a service launched as zetoc (<http://zetoc.mimas.ac.uk>). The service is free to UK institutions supported by the Joint Information Systems Committee (JISC) of the UK Higher Education Funding Councils and by subscription to UK Research Councils, Irish higher education institutions and, since 2001, to National Health Service staff in England and Scotland.

The aim of zetoc is to provide researchers with a means to find and access published research material to aid the furtherance of their own research. It is a service within the JISC paradigm for internet services 'discover – locate – request – deliver' where the aim is to enable users to achieve full electronic 'join-up', i.e. when they discover an article of relevance users can locate further information, request and have delivered electronic full text versions of the article. Initially zetoc provided two major services;

- a search facility reached via a website which can be used to explore the British Library bibliographic database which contains a very wide range of journals, conference proceedings etc and
- an alerting service, zetoc alert, which emails, in plain text, tables of contents of new journal issues to requesting users. Users can also set up an alert search request based on keywords in the article title or an author's name. These saved searches are performed on new data when it is loaded each night, users being emailed with the records of articles that matched. Along with each article listed is a URL, which provides direct entry into the web service that enables the user to take advantage of the linking and document delivery functionality.

Enhancements to the zetoc service, during the period of this evaluation, have provided 'request and deliver' capabilities through direct electronic linking where it can be ascertained an article is available electronically to the user. It also provides non-electronic delivery options, i.e. document supply directly from the British Library and indirectly through traditional inter-library loan routes.

The service rapidly became popular in UK higher education institutions with over 16,000 users registered for email alerts in February 2003 setting 23,000 journal alerts which typically resulted in over 8,000 emails being sent out per night. By the same date zetoc use was around 30,000 sessions and 60,000 searches per month via the web interface. Zetoc has quickly become a very popular service in UK Higher Education and it has received many very positive reviews include the accolade of '800lb Gorilla of UK email alerts' (Carnall 2002) because of its breadth of service.

2. The Evaluation Approach

The zetoc service is obviously a valued and popular service and is already playing a significant role in the 'discover-locate-request-process'. In order to understand what specific role it was playing for users in relation to other services and, if possible, to improve the service, a formal evaluation study of zetoc was started in 2002 involving the Department of Human Sciences at Loughborough University. The zetoc service was still undergoing development and the intention was that the evaluation would be a form of action research. It would provide an opportunity to study user behaviour and for users to give their views on the service. This feedback could then be used to influence the next stage of development of the service.

Manchester and Loughborough had worked together on a previous electronic journal project, SuperJournal (Pullinger and Baldwin 2002). The evaluation studies in SuperJournal had identified a wide variety of user behaviour with the service and a number of reasons for the variation. In the SuperJournal project it had been possible to log the usage made by over 3,000 users and to classify individual behaviour patterns. A cluster analysis of 1,882 users, for example, identified a large number of 1,112 users (59%) who only visited the service once in contrast to a smaller group of repeat users for whom the service became a fundamental part of their academic strategy. In total eight separate clusters of users were identified who were using the SuperJournal service in quite different ways (Eason et al 2000a, 2000b). One of the reasons for the variation of usage was that users were utilising other electronic services as well as SuperJournal and they were trying to find the best way of getting advantages from the services that were available to them.

It seemed likely that, within the large population of zetoc users, there would be variations in usage. The evaluation study therefore set out to determine the different types of usage, and the way zetoc was contributing alongside other electronic services to the 'join up' process of getting from discovery to full text.

The evaluation study was undertaken in three stages. The initial stage was an electronic questionnaire to ascertain overall usage patterns and user views on the good and not so good aspects of the service. It was publicised on the website and in email alerts sent to users and sought to get a large representative sample of zetoc users. The second stage was a brief electronic questionnaire publicised on the website after enhancements to the service had been introduced. The principle aim was to determine user responses to the changes that had been made. The final stage was an interview programme undertaken at a small number of institutions. This was to explore, in depth, how users' approached the task of maintaining awareness of progress in their discipline and the part that zetoc played in their approach.

3. The First Electronic Questionnaire; Patterns of Use of Zetoc

The first questionnaire asked respondents about:-

- their usage of the various features of zetoc
- their satisfaction and problems with the service
- other electronic services they used and
- their hopes for the future.

It also collected information about the institution, the role of the user and their research discipline.

The questionnaire was publicised on the website and in email alerts sent to users. It attracted 659 responses from over 100 institutions and from a wide variety of user types. The full results of the questionnaire survey were reported in the interim evaluation report (Eason and Ashby 2002) and only a summary of the major attitudes to zetoc and the patterns of usage are presented here.

3.1 Attitudes to Zetoc

A summary of the major findings is presented in table 1.

Perceived Benefits	
75%	felt zetoc offered a new service they had not had before
79%	felt the main service zetoc provided was 'to keep me on top of current developments in my field'
52%	felt it also helped to 'keep on top of developments in fields associated with mine
25%	felt it helped them to gain access to full text publications
Awareness of Zetoc	
32%	said they had heard about zetoc through mailings from the local library
< 10%	said they had attended some form of zetoc training event
< 10%	said they had used the website training materials or the email helpline
Usability	
83%	did not find the interface at all confusing
79%	Always felt they were in control of the service
91%	felt it was straightforward to set up an alert service
91%	felt they could search the database without any problems
Context	
> 60%	used related kinds of electronic service, e.g web search engines (87%), on-line reference services such as COPAC (74%), and electronic journal services, e.g. Science Direct (63%)
72%	only use zetoc to find out what is available. They use other services to request documents

Service Enhancements	
27%	suggested enhancing alerting services by linking to abstracts, electronic full text or local e-journal lists
9.7%	suggested enhancing searches of the database by linking to abstracts, electronic full text etc
9.2%	suggested integration with other electronic services such as local electronic journal holdings, electronic journals on the web etc

Table 1
Major Findings from the First Questionnaire Survey

The overwhelming response was that zetoc was providing a very valuable current awareness service. Very few users had received training in use of the service but most found it very straightforward to use with few usability problems. Most users were already using other services that helped them obtain full text documents. The majority of users saw zetoc as only helping them find what is available but when given an opportunity to suggest service enhancements most suggested 'join up' developments; links to abstracts and electronic full text services. It appears that the users were pleased to have an electronic current awareness service and were looking forward to a fully integrated electronic service leading to the delivery of full text electronic documents.

3.2. Usage of Zetoc

Of the two major services Zetoc offers:-

- 75% of the users had set up alert services and saw this as a very good way of keeping up to date with developments in their field. They had set up an average of 13 journal alerts each but some had set in excess of 50 alerts.
- About 50% of the users had searched the database and valued the wide range of material that was available.

What was clear from the responses was that users varied a great deal in the degree of use they made of the service. In order to analyse this a usage metric was constructed consisting of four topics examined in the questionnaire:-

- parts of the service used, e.g. search, alerts, document ordering (8 items)
- website support service, e.g. training materials, helpline (3 items)
- adaptation, e.g. refining alerts, storing and processing searches, sharing with colleagues etc to render the service to a configuration appropriate to the user's needs (8 items)
- linking, using the Z39.50 capability to, for example, access Zetoc from bibliographic software such as EndNote (3 items).

In total this gave a possible total score of 22. An individual score out of 22 was a measure of the degree to which the user was utilising the breadth of facilities in the zetoc service. Table 2 below separates the respondents into major roles of users and provides the user role and overall usage scores for 655 respondents.

Usage Score	Librarians		Researchers		Post-Grad Students		Faculty		Others		Total	
	No.	%	No.	%	No.	%	No	%	No	%	No.	%
1-2	29	18.6	59	37.8	37	27.2	49	44.5	49	50.6	223	34.0
3-4	45	28.8	41	26.3	45	33.0	34	30.9	21	21.7	186	28.4
5-6	36	23.1	32	20.5	36	26.5	15	13.6	15	15.5	134	20.5
7-16	46	29.5	24	15.4	18	13.2	12	11.0	12	12.2	112	17.1
Total	156		156		136		110		97		655	
Average	5.19		4.14		4.08		3.22		3.51		4.08	

Table 2
The Usage of Zetoc

As table 2 shows a large majority of the users made fairly limited use of the facilities available. There was a break in the distribution at a score of 6; 83% scored 6 or less and then there was a thin spread of scores from 7 to 16. 34% of the users scored only 1 or 2 (mostly just the use of journal alerts). There are also notably different profiles of scores for the different user roles. The average score for the sample was 4.08. The librarians were the most prolific scorers with an average of 5.19 with nearly 30% scoring 7 or more. The lowest average was for faculty members (university research and teaching staff with tenured positions). Their average was 3.22 with 45% scoring 1 or 2. The ‘other’ category included national health workers, administrators and managers and they too had a low average (3.51) and a large number (50.6%) scoring 1 or 2. Research staff and postgraduate research students occupy positions closer to the average for the sample.

This data was further examined by dividing the sample into two user types, the ‘passive majority’, (the 82.9% scoring 6 or less), and the ‘active integrators’, (the 17.1% scoring 7 or more). Examining the questionnaire data for each group leads to the following description of these two user types:-

- **The active integrators** This group of 112 users appear to understand the range of services zetoc offers and the way it relates to other services. Most of these users have developed a stable routine by which they keep abreast of new developments and by which they store and process articles of interest. They know, for example, that they are less likely to get an abstract with the zetoc service than they are with some other services but may

be able to reach a different and larger range of journals. They also know how best to exploit the 'join-up' possibilities available to them at their institutions. They know, for example, which of the journals in which they have an interest can be obtained as full text electronic versions in their host institution, which are in their local library and which they need to seek by other means. They make use of many other electronic services. In the sample as a whole only 10% reported making use of Z39.50 services and most of them were members of this group

41% of this group are librarians and could be said to have a professional interest in keeping abreast of zetoc and related services. Another 37% are research staff and post-graduate students who, by their own accounts, are expected to sustain a good awareness of particular parts of the literature and may have the time to achieve this objective.

- 8. The passive majority** This group of 543 users tend to see zetoc as primarily an alert service that provides them with regular emails. We have called this the 'passive' group because many report creating alerts and 'letting the service do its job' as one respondent remarked. Very few of these users had a stable routine for managing the information they received from zetoc or of following up articles of interest. They tended to let the alert messages accumulate in the hope they would find the time to check them and process them later. Many of them made occasional use of the database when they had to search an area outside of that covered by their alerts. Very few had received or sought any training in zetoc and when asked why they did not use other services it provides said they were unaware of them. Indeed, as a result of responding to the questionnaire, many said there was obviously more they could use and they would now look again at what zetoc had to offer. They did not make a great deal of use of other services and often found it difficult to track down articles when they had to switch from one system to another to do it.

There was good representation of all user roles in this group but the very restricted scores were primarily faculty members and 'others' such as managers and administrators. In both cases these are work roles that include a wide range of responsibilities and the use of a service such as zetoc might have low priority in relation to other work tasks.

This stage of the evaluation demonstrated that zetoc has the potential to provide users with a valuable current awareness service. Unfortunately only a minority of the user population are making full use of the capabilities of the service. The reasons why the majority are making restricted use of the service need investigating in the next stages of the evaluation. One issue united both users of both types; they all want an integrated, seamless service to enable them to get from discovery to the delivery of a full text electronic version of articles of interest. This is encouragement to seek ways of enhancing

the service to provide more 'join-up' options. Whether the 'passive majority', with restricted awareness and restricted usage, would discover any changes that were made and make use of them would of course be open to question.

4.0 System Enhancements

During 2002, partly as a result of the first evaluation study, a series of enhancements were made to the service and at the same time many universities were enhancing and integrating the electronic services available to their users. One of the major changes to the zetoc service was the addition of further links to other services through the Z39-50 protocol. Z39-50 is a network protocol that allows searching of remote heterogeneous databases and retrieval of data from an individual user interface. As a result of the enhancements many users were able to access the zetoc database from other services, for example from portals, from bibliographic software and from linking software. Similarly, if they found an article of interest using zetoc, users could gain direct access to facilities in their institution by which they may be able best to obtain further information, perhaps electronic full text of the article.

The introduction of these enhancements had a dramatic effect on the usage of zetoc. In September 2002 there were 2,317 Z39.50 target sessions across UK academic institutions. By March 2003 it had risen to 11, 881. A related development was that eleven institutions had introduced 'resolvers' that meant that in some cases users could go from a zetoc search directly to a service which could check the availability of selected items in the resources of the institution. In March 2003 two of these institutions had achieved over 20,000 zetoc sessions in the first quarter of the year.

The pattern of usage was changing as a result of these enhancements. The next stage of evaluation sought to find out if users were now achieving the more integrated electronic 'join-up' service that they wanted,

4.1 The Second Questionnaire; The Effect of the Enhancements

The second questionnaire had three objectives;

- to examine the impact of the enhancements,
- to validate the conclusions of the first study about the benefits users sought and the problems they experienced and,
- to explore further the usage behaviour of the different user types

A short electronic questionnaire was constructed which asked users;-

- (a) about their usage of all the functionality in the zetoc service, including the new functions.
- (b) whether they had used the new functions, and if so, what they thought of them.

- (c) to prioritise from lists derived from the first questionnaire the major benefits they expected from zetoc and the major challenges they wanted addressed.

In this case the questionnaire was made available only from the zetoc website (and not via email alerts). This had an affect on the overall response rate and on the types of user who responded. It is apparent that many of the passive users of zetoc do not visit the website; their contact with zetoc is only via the email alerts they receive. These users would not therefore have been aware of the second questionnaire. 158 responses were obtained. 108 responses were from librarians and the 19 'others' were mostly NHS users who were beginning to explore what the service had to offer. On the basis of the first questionnaire it can be assumed that this sample is biased in the direction of the 'active integrator' users and the interpretation of the results takes this into account.

The overall usage scores for the user roles and the whole sample are reported in table 3. The functions that have been added as a result of the enhancements mean that the highest possible usage score has risen from 22 to 29.

Usage Score	Librarians		Research Staff		Post-Grad Students		Faculty		Others		Total	
	No	%	No	%	No	%	No	%	No	%	No	%
1 – 2	4	3.7	3	30.0	0	0	0	0	5	26.3	12	7.8
3 – 4	8	7.4	0	0	2	20.0	1	9.1	4	21.1	15	7.8
5 – 6	22	20.4	2	20.0	3	30.0	2	18.2	2	10.5	31	19.9
7 - 20	74	68.5	5	50.0	5	50.0	8	72.7	8	42.1	100	64.5
Total	108	68.3	10	6.3	10	6.33	11	7.00	19	12.02	158	
Average		6.32		4.40		6.30		7.45		5.06		6.00

Table 3
Usage Measures for the User Roles after Service Enhancements

Compared with the results from the first questionnaire (table 2) there has been an increase in the overall score from an average of 4.08 to 6.00. There are very few low scores in this sample compared with the previous sample (7.8% compared with 34.0%) and there has been an increase from 17.1% to 64.6% in the respondents in the highest scoring category. There are two possible interpretations of these changes; either the enhancements have had a dramatic effect on the amount of usage or the increases are a product of the difference in the sample obtained. One way of checking which is the case is to compare the results of the two large groups of librarians in the two samples. The librarians were the largest group in the active user category. Their average in study one was 5.19 and in study two it is 6.32. The functionality in the service has risen by 32% (from 22 to 27) and the increase in the average score is 22%. This suggests that, although the presence of a large number

of librarians in this sample has pushed up the average, there has also been an increase because of the enhancements. An unusual feature of these scores is that faculty members, who were low scorers in the first sample, achieve the highest score in this sample and have a group of eight users who have achieved scores in the highest category. The questionnaire may have attracted responses from the more active members of the zetoc user community and it is safest to assume that this is a set of results representative of active users rather than the total population of zetoc users.

It is possible to examine the impact of the enhancements more closely by looking at the results of a question asking who had used them and these are presented in table 4.

Enhancement	No. Used	% Used	Evaluation					
			Better		No Difference		Worse	
			No.	%	No.	%	No.	%
Request a copy via Library document supply unit	38	24.1	28	73.7	9	23.7	1	2.6
On-line article search; 'Worth a try'	36	22.8	13	36.1	22	61.1	1	2.8
The COPAC Search	26	16.5	17	65.4	8	30.8	1	3.8
Another menu e.g. SFX - the local 'resolver' server	11	7.0	10	90.9	1	9.1	0	
Non-Frames zetoc alert	4	2.5	2	50.0	2	50.0	0	

Table 4
The Effect of the Enhancements

Up to 24% of these respondents had tried these enhancements in the few months since they had been launched and the respondents who had made use of them were mostly positive about their value. The biggest response was to the opportunity to 'request a copy' followed by online article search which was advertised as 'worth a try' because whether an online article was available depended upon the services subscribed to by the local library. Whilst most users valued the 'request a copy' service, the majority of users felt 'worth a try' made no difference because it was frequently unsuccessful (see section 4.2 below for more on the frustrations of unsuccessful requests). It is noteworthy that the most positive response was to the service that linked directly to the local library 'resolver', e.g. SFX, which could show more precisely the best source of a document available to the user. It is clear that the users valued this service. However, it was available in some institutions but not others and the numbers who had tried it are therefore limited.

From the evidence of the overall usage statistics of zetoc and the results of the second survey it appears that offering Z39.50 links to and from zetoc is increasing the range of usage of the survey. These opportunities are beginning to be exploited by librarians and other active users. Whether they are reaching the passive majority remains to be explored.

4.2 The Benefits and the Challenges.

The second questionnaire was also used to validate some conclusions from the first questionnaire in which users had expressed a variety of benefits they were seeking from electronic services in general and zetoc in particular. They also commented on the major problems they met and challenges to be overcome both in general and for zetoc if they as users were to achieve the benefits they were looking for. The benefits and the challenges were summarised in the second questionnaire and respondents were asked to rank the three that were the most important. The overall rankings for benefits are summarised in table 5 and for challenges in table 6. The score for each item on the list has been calculated by allocating three points for a first preference, two points for a second preference and one point for a third preference.

Ratings on these scales were also obtained for the 26 users interviewed in the third study to be reported in Section 5 below. These results have been combined with the results from the 158 respondents to the second questionnaire giving a total of 184 responses.

Benefit	Importance		Zetoc helps Achieve	
	Rank	Score	Rank	Score
Keeping on top of current developments in my field	1	327	1	254
Establishing a current awareness and searching routine	2	261	2	196
Getting from search to full text electronic publications	3	162	3	113
Keeping on top of current developments in fields associated with my own	4	121	4	110
Getting from search to full text hardcopy publications	5	84	5	81
Integrating use of the services available to me	6	63	6	57

Table 5
The Benefits Users' Seek

The most important benefit being sought is electronic help with current awareness. The top priority by a considerable margin was keeping on top of current developments and this is what zetoc helps users to achieve. The second benefit that is sought is to be able to establish a routine for keeping up to date and again this is supported by zetoc. It is

important to note that this is a sample of active users who probably do achieve an organised current awareness routine. The more restricted users who are less able to develop or sustain a routine are not well represented in this sample. The fourth priority is keeping on top of developments in related fields and this is an objective zetoc is particularly well suited to because of the wide range of journals etc that it can report. The issue of using electronic services to get document delivery does not appear until the third priority; to get from search to full text electronic publications. These users give greater priority to obtaining electronic rather than hardcopy full text publications. There is an exact correlation between sought benefits and the goals that zetoc helps achieve. Integrating use of these services is not a high priority for these users who have been used to finding their own ways of combining the various services available to them.

Challenges	Priorities for All Services		Priorities for Zetoc	
	Rank	Score	Rank	Score
Making it easier to get from search result to full text	1	306	1	301
Improving the usability of services	2	170	2	177
Enabling better integration of different services	3	162	3	140
The avoidance of information overload	3	152	5	90
Getting to electronic text but finding you are not allowed access	5	132	4	131
Improving the usability of system set-up procedures	6	59	6	78
Overcoming 'too many changes, too much to learn'	7	35	7	34

Table 6
The Challenges to be Overcome

The challenges are problems users' face and the areas for development that they see as most important. It is here that the plea for the integration of services to provide a direct, electronic route from discovery to document delivery is made most forcibly. Two of the top three challenges relate to this need. Making it easier to get from search to full text is the top challenge users wish to see addressed and it is the top challenge for zetoc. This is reflected in the third priority, which is to achieve better integration of the different services. The second priority is improving the usability of services although in many cases the additional comments show that users are referring to the ease of moving from one service to another. Two sources of aggravation to users as they seek an awareness routine and a 'joined up service' are avoiding getting information overload and avoiding the promise of electronic full text only to be refused access. There were many reports of time wasted in the belief an electronic document would be obtained only for permission

to be denied at the end of the trail when the users had entered a service their institution did not subscribe to.

It is noticeable that this sample of users did not rate highly some of the concerns mentioned in the first study. They were not concerned about the pace of change in services and the difficulty of keeping up. As people who had developed good awareness routines they were similarly not so concerned about awareness issues raised in the first survey, e.g. the desire to obtain abstracts directly from the email alert. These are the concerns of the passive users. As a generalisation we might say from these results that the active users have sorted out their awareness strategies and are now looking for the 'joined up' service.

5.0 The Interview Study; Approaches to Using Zetoc

The third stage of the evaluation study was to conduct interviews with individual zetoc users in selected universities. There were four aims:-

- to obtain an account of the approaches users employ to manage information search and the role of zetoc in their strategies,
- to understand the barriers and difficulties they experience
- to explore the implications of the local institutional arrangements on the usage pattern that develops
- to improve our understanding of the 'passive majority' because they are under-represented in the second questionnaire study. The interview sample is therefore skewed in the direction of user roles more likely to be part of this user type.

To achieve these objectives required an in-depth study of each user and this study concentrates on depth rather than breadth. The over-riding aim is to develop a deeper understanding of some of the user attitudes and strategies identified in the earlier studies rather than to achieve statistically significant results.

Twenty-six users were studied from seven universities. Most were recruited from the respondents to the first questionnaire study that had indicated their willingness to take part in a follow-up study. Respondents were first asked to complete a usage record covering the same functions as the second questionnaire and the benefits and challenges ratings from the second study. The respondents were then interviewed in person or by telephone. The usage record was used as a basis for exploring the way they used zetoc and the other services they were also using. Particular attention was paid to the user's approach to:-

- current awareness – the extent to which the user had developed an electronic strategy for keeping up-to-date with developments in their discipline and the part that zetoc was playing in it.

- getting from discovery to a full text document – the extent to which the user’s utilise electronic services and the extent to which they use zetoc as part of a ‘joined-up electronic’ strategy.

5.1 User Roles in the Interview Study

The sample was chosen to give good representation of the four major kinds of zetoc user; faculty members, research staff, post-graduate students and librarians. An attempt was also made to include some universities that had introduced resolver services and some that had not.

User Role	Universities									
	A		B		C		Others (4)		Totals	
	No.	Score	No.	Score	No.	Score	No.	Score	No.	Score
Faculty	3	7.3	4	5.7	1	3.0	3	4.3	11	5.5
Researchers	2	11.0	1	6.0	2	3.5	1	7.0	6	7.0
PG Students	2	11.5	1	2.0	1	7.0	1	7.0	5	8.0
Librarians	0	0	0	0	2	8.0	2	8.0	4	6.8
Totals	7	9.5	6	5.2	6	6.1	7	6.1	26	6.5

Table 7
Usage Scores from the Interview Study

The sample is made up of a group of 6 or 7 users from three universities and one or two users from each of four universities. The overall usage score for this sample is 6.5 compared with 6.0 which was the average in the second questionnaire study. This is surprisingly high given the mix of user roles in the sample. However, the scores for University A are very high and this is a University which has introduced a resolver service which gives direct access from the zetoc database to a means of identifying how best to locate specific documents from the institution resources. All of the users were making use of this service. If the scores from University A are excluded the overall average drops to 5.4 and the user role averages are; faculty 4.3, researchers 5.0, PG students 5.7 and librarians 6.8. These scores are in line with expectations following the enhancements to the service.

5.2 User Approaches in the Interview Study

However, the major purpose of this study was to identify the different ways that the respondents used zetoc. The interview records were analysed for the way the users approached current awareness and the way they approached following-up an article of interest. The approaches were categorised as follows.

- **Current Awareness.** The approaches were divided into the *ad hoc* and the *organised*. The *ad hoc* users had set zetoc alerts and sometimes followed them up

when they arrived. Often they were too busy and hoped to check them later but often found the opportunity was lost. Sometimes they identified articles they wanted to follow up but only occasionally did they manage to follow them up. Some of these users had set a lot of alerts and complained about being overloaded by the alerts. They intended to cut the number but did not get round to it. By contrast the *organised* users had a routine they followed when the alerts arrived. Some checked them and deleted them if there was nothing relevant. Some transferred them to separate files and marked the ones they wanted to follow up. Some did the follow up immediately but most stored items of interest until they had a set to engage in a concerted follow up. Some users organised the lists of alerts into the journals and kept them as their own electronic 'library' of what is going on in the major journals of their field. Quite a lot of these users shared new information with their colleagues and they had trimmed their alerts to just those that were essential in order to avoid overload. Many of these users also used other alerting services for specific journals, often because they could get abstracts or full electronic text, and they used zetoc to keep an eye on a range of relevant journals they could not monitor otherwise. Although there were variations in the way the users managed alerts the common feature was that they had evolved an organised and sustainable way of making use of the information they received from the service.

The ad hoc users made little or no use of the zetoc database as a search facility. This meant that their only contact with the zetoc service was the alerts and they were unaware of the range of functions zetoc offered or any of the enhancements that had been made. Some of the organised users who had set restricted numbers of alerts did not make use of the database and their exposure to zetoc was limited to a few alerts. Most of the organised users, however, also used the database along with other databases and had clear ideas about which source to use for what purpose. Zetoc was usually used when a broad based search was being made. Other databases, having more limited holdings, were often used because the user knew their institution had a subscription so that they could get to electronic full text if they found items of interest.

- **From discovery to full text** Three different approaches were identified for getting from an article of interest to the full text of the article:-
 - **Paper.** Some of the users followed up electronic location of articles of interest by traditional paper routes. Typically, they sought paper copies of articles of interest by visiting their library. If they could not obtain the articles by this route they would order copies by inter-library loan.
 - **Separate Electronic Services.** Once they had obtained a zetoc notification of something of interest many of the users tried to follow it up by using other electronic services. This group of users left the zetoc service in order to be able to do this and tried a variety of services that were available to them to obtain the article. They might go to their

electronic journal listing of their university, they might try services that the university subscribed to, they might go directly to the website of the journal etc. They often had to re-enter the details of article they were seeking in order to go to the new service. Some of the users were well organised and knew how to reach the abstracts or full texts of the major journals of interest to them. Many were less well organised and were often frustrated in their searches and reverted to a hunt for a paper-based copy.

- **Integrated Electronic Services.** Some users sought electronic documents by using the routes to and from zetoc to move between services. They could, for example, enter the zetoc database within a resolver service and use it to locate further information on articles of interest, they could move details of articles into bibliographic services such as EndNote or they could use the ‘more information’ function to locate where abstracts or full text might be obtained. They were using the enhanced functions of zetoc to achieve a more integrated electronic service. The degree to which they could do this and the degree to which it was successful depended upon the electronic resources available in an institution and some users were more successful than others in achieving an integrated service.

The combination of two approaches to current awareness and three to getting to full text gives six possible usage patterns. Five of these were found in the sample; there were, perhaps for obvious reasons, no examples of ad hoc awareness and electronic integration follow-up. The frequency of the other strategies and their association with user roles is given in table 8.

Strategies	User Roles									
	Faculty		Researchers		PG Students		Librarians		Totals	
	No.	Score	No.	Score	No.	Score	No.	Score	No.	Score
Ad Hoc Paper	2	2.0	1	1.0					3	1.7
Ad Hoc Sep. Elect.	1	6.0			1	2.0			2	3.0
Organised, Paper	3	6.3			1	7.0			4	6.5
Organised, Sep. Elect	4	6.2	3	6.3	1	8.0	3	7.0	11	6.6
Organised, Int. Elect.	1	6.0	2	11.0	2	11.5	1	6.0	6	10.2

Table 8
User Strategies for Awareness and ‘Join-Up’

A summary of the five approaches in use and who is using them is as follows:-

- **Ad Hoc: Paper** Three users worked in this way and used zetoc only to provide electronic alerts. They obtained low usage scores for zetoc and are probably characteristic of the 34% of zetoc users in the first questionnaire survey that scored 1 or 2. They continued to use traditional methods of obtaining full text, i.e. they visited the library. Two of the users were members of faculty and one was a researcher. They reported being too busy to use all the zetoc information they obtained or to understand all the services that might be available to them. They experienced zetoc as a somewhat frustrating service and wanted more help in managing the service but not the kind of help that demanded more from them.
- **Ad Hoc: Sep. Elect.** Two users dealt with awareness in an ad hoc way but were keen to obtain electronic copies when they did find something of interest. They did so by using their libraries' electronic resources and they often found this a frustrating process. In this category were one member of faculty and a research student. They knew little of the range of services available in zetoc or in general and often reverted to a paper strategy when the electronic route failed them. Both of these ad hoc groups reported they were more likely to abandon trying to obtain full text when the route got difficult than to persevere with the search. This was the group that really wanted zetoc to give abstracts as part of the alerting service because this would provide an immediate indication of whether an article was sufficiently interesting to warrant beginning an uncertain and time consuming search process.
- **Organised: Paper** Four users were well organised in their electronic current awareness strategy but switched to a paper strategy to get full text. These users obtained zetoc usage scores of around six because they used alerts and searched the database. The reason for continuing with paper-based strategies most often given was that their institution did not have the electronic resources in their discipline to make electronic 'join-up' successful. Three of these users were members of faculty and one was a research student. The faculty members also cited the time and effort needed to know what services were available. Some had tried electronic follow-up without success and had given it up. Faculty members often found it time consuming to do the follow-up by searching for paper copies and used their doctoral students for this purpose.
- **Organised: Sep. Elect.** The most common approach in this sample is an organised approach to current awareness followed by the use of a range of electronic resources to try and obtain abstracts or full-text electronic documents. The zetoc usage scores are in the range of six because the follow-up does not use zetoc facilities. These users are often quite knowledgeable about other services, e.g. Science Direct, and know what they can achieve by using them. However, they often report frustrating experiences of not achieving what they believe should be possible. Eleven users are in this category and all the users are represented. It includes, for example, three librarians who know the range of electronic resources in their institutions and consider it part of their expertise to

know the best way to use these resources to best meet the needs of their customers. In most cases these users are in institutions that have fairly good electronic resources but do not have the kind of services that support integration. However, some of these users are in institutions with these services and are either unaware of how to achieve integration or do not see the need because they know how to get what they want.

- **Organised: Int. Elect.** The final group of six users are exploiting a range of electronic 'join up' facilities and have zetoc usage scores of over 10. They are in institutions that provide these facilities and four of the users are from University A. A number of user roles are represented in this group suggesting that the most important factor is having the 'join up' facilities available and working effectively so that the users are likely to enjoy sufficient success to warrant adopting this as their preferred strategy.

Although the numbers in each of these categories are small, the users are able to articulate the strategies they have adopted and the successes and frustrations associated with them very clearly. The interview transcripts show a range of professional people keen to stay on top of developments in their field and struggling to make the best use of the resources available to them to do this. This study shows more clearly than the two questionnaire studies that users are frequently using a range of other electronic services and part of their struggle is to find the best way of using all the resources to meet their individual needs. The sample numbers are too low to warrant any generalisations about how common the different approaches may be in the zetoc user community but there are two reasons to believe this sample is weighted in the direction of users who are exploiting the electronic resources available to them. The first reason is methodological; it again proved easier to recruit interviewees who were keen to talk about their usage of zetoc than very low level users. Why would marginal users of the service want to spend time talking about it? The second reason is sample bias; few universities have installed powerful resolver services but one of them contributed over 25% of this sample. If, as the first study showed, 34% of the zetoc community only score 1 or 2 it is likely that the ad hoc strategies are much more prevalent in the community than they are in this sample.

6.0 Discussion; A Success Story with Variable Take-Up

Zetoc is a very successful service and many of its users now consider it an essential part of their information management strategy. The data collected in this evaluation about user aspirations for library services shows there is a widespread need for:-

- An electronic current awareness service
- An integrated 'join up' service that facilitates the movement from discovery to delivery.

The results from the evaluation show that zetoc is a widely valued, easy to use, current awareness service. The alerting service is a central pillar of the current awareness strategy of many in higher education and the opportunity to search the database is widely valued. As its functionality is enhanced so the potential value of zetoc in the delivery of a fully

joined-up service is also increasing. There are some users in some institutions who are beginning to enjoy the benefits of these enhanced facilities.

And yet this success story has its limitations. Many of its users, probably the majority, make use of Zetoc in a restricted way and are not exploiting it fully to achieve their own stated aims. We know from previous research that this was also the case with the SuperJournal electronic journal service and we strongly suspect that it is also the case with many other services. This is because usage of a service is only partly to do with the nature of the service; there are a number of other variables at work. Figure 1 depicts the other major variables that influence the take-up of the facilities in zetoc.

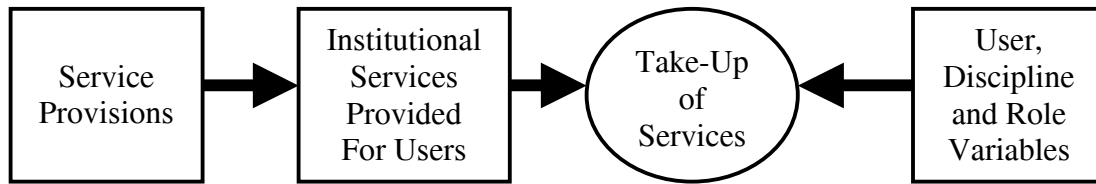


Figure 1
Variables in the Usage of Zetoc

The variables that shape the provision of services and then the take-up of them are as follows:-

- **The Service Provisions** Zetoc can be seen as a major vehicle providing a common service across higher education and the NHS. It is one of a number of services which could be used in combination to provide users with a comprehensive electronic awareness service and a joined-up document delivery service.
- **The Institutional Context.** Although the service is technically possible it may not be available to users in all universities. Zetoc may be available across the universities in the UK but how people use it depends upon a range of factors in each institution. The local library appears to be the major vehicle by which users hear about zetoc and the extent to which they understand the service it can provide. The local library stocks and subscriptions to electronic resources define how successful a user may be in following up articles found to be of interest. Similarly the opportunities for the use of Z39.50 facilities depends upon the degree and form of implementation made available in each institution. There is clear evidence in the evaluation data that some universities are able to offer their users a richer and more integrated service than others and that usage of zetoc varies as a consequence.
- **The User, the Role, the Discipline and the Context of Use** Even in the same university there is a wide range of user behaviour. Four factors seem to contribute to this range. There are no doubt individual differences between users, for example, personality, age, technical background which contribute to the variation in usage although these

factors have not been studied in this evaluation. A variable that was studied and was found to have considerable impact is the role of the user. Some user roles, for example, librarians and others whose role gives them a professional interest in electronic services, usually keep up-to-date with what is available and exploit what is possible in their institution. Others such as research students may be made aware of zetoc and other services as part of their research training. The majority of users, especially members of faculty, have many work priorities and spend little time keeping up-to-date with the facilities available to them or learning how to exploit them. They tend to become passive and restrictive in the way they use services; to stick to what they know. The discipline in which the user works also plays its part. Some fast moving disciplines e.g. genetics, require very active awareness routines and have a lot of electronic resources available and researchers in these fields need to exploit these electronic services. In other disciplines, e.g. the humanities, these requirements are less evident. The degree to which a discipline is provided for also has its effect upon the use of zetoc. Many users use the breadth of zetoc coverage as a way of covering for the lack of local holdings and subscriptions in their discipline; they use it as a 'back-up' service. Finally there are many 'context of use' factors which also have an influence; e.g. how far the user is from the university library or what services they can access from home. Another factor is whether they are lone scholars or part of a team which has somebody with the role of 'local expert', the person who keeps track of the services available and alerts colleagues to useful developments.

One way to view how users come to develop different usage profiles is to consider them as initially in a stable state; using some services in ways they understand to achieve a more or less satisfactory service. Zetoc and other services present them with new opportunities and it is quite likely that with full knowledge they would gain additional benefit from them. However, first they have to become aware of these new possibilities. Then they have to learn about them, experiment with them and evaluate them. If this process proves positive, the new facilities may become part of a revised stable state. The users who become active users appear to be in roles that facilitate the required awareness and experimentation. The 'passive majority' are busy with the rest of their responsibilities and may have adopted a strategy that cuts them off from hearing about new developments and limits the degree to which they can afford to experiment. It also tends to set higher criteria for what constitutes a successful experiment. Running through all the evaluation studies are comments about the 'worth a try' features of current join up services. Although it has not been systematically researched it appears that the active users are more willing than their colleagues to try new routes and to accept frequent failure. Their colleagues seem to respond to the frustrations of time wasted and lack of success by declaring they will not use the service again and reverting to their tried and trusted procedures.

The implications of this examination of user behaviour for the providers of electronic services and for those delivering services in institutions are:-

- that current awareness and 'joined up' services are very much valued by users. They are goals the users wish providers to continue to strive for.

- that it is necessary but not sufficient that these goals are technically possible to achieve. Similarly it is necessary but not sufficient that institutions make them available. It is not even sufficient to provide regular training events because many users will not take advantage of them.
- that we have to find ways of encouraging the full range of users to become aware of and to experiment with what is available; perhaps by alerting them to new opportunities as they use the systems they do use, by giving them more positive experiences when they do try new facilities, by identifying the 'local experts' who can help their colleagues etc.

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The requirement for seamless join-up perhaps provides the clue to how to help these users. If new services and enhancements are organically linked to the services already familiar to users, the extension of usage can be evolutionary and can occur without users having to make a step function in their understanding of services. Although the evidence at this stage is slight the exciting part of the zetoc story may yet be the take off caused by the Z39.50 enhancements which provide an undemanding linkage mechanism for users of great value to their 'joined up' service aspirations.

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