



Sustainability of Digital Outputs from AHRC Resource Enhancement Projects

Executive Summary

This report is based on a survey of all digital resources funded through the AHRC's Resource Enhancement Scheme from November 2000 until May 2006. Questionnaires were sent to 173 projects to elicit grant-holders' views on the sustainability of their projects and related matters; 115 replies were received. Of these the greatest number were websites with online searchable databases (83), followed by online catalogues (23). All but 23 of the total were hosted on university websites, including specialist centres or libraries and the Arts and Humanities Data Service..

Technical sustainability involves the provision of an appropriate digital environment to host a resource and the need to update the resource's technical format as the environment is updated around it. Views on this varied considerably according to the type of host. PIs have the most confidence in their university library to maintain their digital resource, followed closely by external specialist centres. Specialist centres internal to the university and other university hosts enjoyed less confidence. All projects hosted at the AHDS expressed grave concerns for their project's sustainability in the light of the AHDS closure. Concerns about sustainability also varied according to type of resource. The great majority of online catalogue projects had no concerns; about half of the 80 online searchable projects did. Our impression is that many projects in the last category did not plan in detail from the beginning how to sustain their outputs.

Concerns expressed included: the short term nature of hosting contracts with external providers; absence of funding for technical support; payment of future license fees for images and other material; staffing issues, especially loss of technical staff. Means used for keeping resources technically up-to-date included work by PIs on a voluntary basis and the use of funds (and sometimes staff) from later projects. A few universities provide dedicated support for this.

Academic updating of the content of resources is required by the vast majority of projects (92/115), of which about half envisage difficulty in carrying this out, mostly because of the non-availability of funding. Many projects carry it out on a voluntary basis, some with the help of funding from new projects; in a few cases users help.

On related matters, over half the respondents to our questionnaire (65/115) said they were collecting usage statistics for their web resource, or had plans to do so once the site went live. Responses regarding publicity and promotion ranged from those that had received national media interest, to those who did not advertise their resource at all, due to lack of resources. Most PIs publicised their work to their subject communities, at conferences and so forth.

We categorized PIs' comments on the technical support provided by their institution for digital projects from Excellent to None (i.e. no support). Of the 109 who answered this question 34 were categorized as Excellent, 23 Good, 28 Acceptable, 19 Minimal, 5 None. About two-thirds of respondents in the first three categories hosted their resource at their own institutions; rather fewer in the last two categories did so.

Our conclusion, based largely on the responses relating to technical sustainability, is that there is a significant threat to the sustainability of a substantial though as yet unquantifiable proportion of the Resource Enhancement outputs, and that the AHRC would be wise to

address this. There are also lessons to be learnt about the funding of future data creation projects: steps can and should be taken to increase their prospects of sustainability, by firming up the Technical Appendix and through greater involvement of expert centres as project partners.

The Questionnaire

Printed and published books and journals survive for generations and even centuries on the bookshelves of libraries. The publications which were, until recently, the expected outcome of research in the arts and humanities have almost unlimited life spans. Electronic resources, by contrast, are prone to rapid obsolescence, often becoming unusable after just a few years. With significant public money being spent on the creation of digital resources (databases, websites, electronic library catalogues, CD-ROM publications, etc.) it is necessary to ensure that the outcomes remain available for a period which warrants the economic and social investment. The present report is based on a survey of a substantial set of such resources (197), funded through awards made by the AHRC's Resource Enhancement Scheme from its start in November 2000 until May 2006, when the scheme was all but completed. The main aim of the survey was to ascertain the grant-holders' views on the sustainability of the resources they were creating or had created; some related questions were included, the most significant being a request for evidence, where it was available, of the resources' value to the research community. This last matter will be dealt with in a separate paper.

Much of the reason for the survey results from the recent termination of funding for the Arts and Humanities Data Service (AHDS). But while this has clearly given added urgency to problems of sustainability, it needs to be made clear that the AHDS did not, except in a few cases, guarantee the sustainability of all Resource Enhancement scheme outputs in all their functionality. As we shall see, most of these took the form of on-line searchable databases (often multi-media), and in all but a few cases the database in its full form, including the user interface, was hosted at sites other than the AHDS. The role of the latter in the majority of cases was to ensure preservation of the underlying data resources on which the user interface rested, and to provide essential advice about good practice.

In the AHRC's words, the 'Resource Enhancement scheme funded projects that aim to improve use of and access to research materials and resources'. The great majority of these projects have some form of digital output, whether a website, catalogue, downloadable dataset, or CD/DVD: of the 97 projects in the period covered by the survey was, 173 involved the production of digital outputs, as identified by the fact that they completed the required Technical Appendix. The average grant to projects with digital outputs was £228,155, as against £153,090 to those without: the total amount invested in those with digital outputs was therefore almost £40m. In addition to their academic value for research, ensuring that these digital resources remain useful and accessible is thus a significant economic concern.

Questionnaires were sent to the 173 PIs whose projects involved digital outputs (see Appendix I at the end of this report for the full questionnaire). The first two questions asked for a description of the project and its availability. Questions 3 and 4 asked for views on and plans for the resource's technical sustainability and academic updating of the content. Question 5 requested evidence of the value of the resource in the form of significant research results. The next two questions asked about usage statistics collected and about promotion and publicity for the resource. Question 8 asked about the technical support provided by the institution at which the project was based, and the final question allowed respondents to make any further comments. The character of the questionnaire was qualitative, and it was made clear to the respondents that we were looking for their opinions and judgement. But it was possible to provide direct evidence in support of answers, and a

significant number of respondents did so, especially on the questions regarding evidence of value and usage statistics.

Responses were received from 66% of the projects surveyed (115 out of 173). This figure includes both the majority who completed questionnaires, and questionnaires we filled out from emailed responses or telephone interviews. While we recognize that the respondents are self-selecting, the range and breadth of type of the projects responding and the variety of the responses provide a substantial basis for analysis. Overall, the questionnaire has provided a useful insight into not only the arrangements which projects have made (or not made) for sustaining their outcomes, but also into the way the matter is viewed by the respondents. The findings bring to light some notable problems and issues which are cautionary for anyone funding or undertaking the creation of digital resources.

In answering our questionnaire, the Principal Investigator (PI) of one Resource Enhancement project raised concerns about the future of the website on which the project was mounted. He wrote:

There is a major issue over sustainability for the website after 2010 ... There is also a real need to provide ongoing support for the annual maintenance and updating of the site ... Currently [the directors] are simply doing the work out of good will, and because it needs to be done. This is not sustainable.

This award-winning site is a major resource, widely used internationally both within and outside academic circles, and receives over 4 million hits per year. If such a high-profile project as this relies upon good will and has serious concerns for its future, questions must be asked about the continuing viability of many smaller and/or more specialist projects. Although all may not attract such high usage numbers, all the projects still represent significant public expenditure and all are important academic resources.

Output types and hosts

Based on responses received, we have classified the projects into four types of digital output, as shown in Table 1 below. Almost three-quarters (83/115) can be described as 'on-line searchable'. This includes a range of different types of project, but all have produced or will produce a website through which data, often multimedia, can be both searched and accessed. Projects falling under this category include, by way of example, *CESAR* (a comprehensive on-line repository of 17th and 18th-century French theatre resources), *Northumberland Rock Art* (which provides searchable images and data of rock carvings made by Neolithic and Early Bronze Age people), and the *Complete Work of Charles Darwin On-line*. Some projects falling under this classification are of broad academic and cultural interest while others are aimed at quite narrow research communities.

Table 1: Output Types

Output Type	Number
On-line searchable	83
On-line catalogue	23
Downloadable	8
CD/DVD	1
Total	115

All but a few of the remaining projects (23) have been classified as 'on-line catalogues'. These are usually library or archive catalogues whose main role is as a bibliographical and finding aid. In most cases they involved collaborations between academics and libraries (whether within a university or outside). Examples include an on-line catalogue of the papers

of Wilfred Ward held in St Andrews University Library, and the collaboration between the University of York and the National Railway Museum to digitize the museum’s library catalogue.

A small minority (8) of the outputs are available for download or (in one case) on CD/DVD. Projects requiring download are usually available to users on request from an organization charged with preservation, a role previously filled by the Arts and Humanities Data Service. Fortunately these were mainly at AHDS History, whose downloadable files are still kept by the UK Data Archive.

Table 2 gives a rough categorization of host types and the number of projects under each one. The number of projects held at specialist centres was almost equally divided between ‘University specialist centres’ and ‘Other specialist centres’. The former are research centres with a computing function within a university, such as the Centre for Computing in the Humanities (CCH) at King’s College London, or the Humanities Research Institute at the University of Sheffield. The latter are all national institutes with a responsibility to HE as well as the general public. They include The National Archives, the British Library, the British Universities Film and Video Council (BUFVC), and the Museums Libraries and Archives Council. A complete list of these centres can be found in Appendix II. We have included ‘university library’ as a separate category, as their computer systems are generally separate from the rest of the university’s and their data is more likely to be kept up to date for the long term. ‘University other’ is the residual category that denotes projects held elsewhere on a university site. These could be within a subject department, or some other location, and constitute the largest single category amongst our respondents.

Table 2: Host Types

Host Type	Number
University other	53
University specialist centre	20
Other specialist centre	19
University library	10
AHDS	8
Other	3
Commercial	1
n/a	1

The ‘AHDS’ category covers projects where the full resource is held at any one of the centres of the former Arts and Humanities Data Service: the Executive Office at KCL, Archaeology at York, History at Essex, Literature Languages and Linguistics in Oxford, Performing Arts at University of Glasgow, or Visual Arts at University of the Arts in Farnham. As indicated above, the AHDS also had the role of preserving the underlying data produced by AHRC-funded projects, but this is not included in the present figures. At the time of writing, all the former AHDS centres are preserving and providing access to their holdings, though there are serious problems about the accession of new deposits. Sites that did not fit into any of the above categories we have grouped together as ‘Other’. For example one project is hosted by the Liverpool City Council, another is hosted privately, paid for out of the PI’s personal research allowance, and the third is maintained by Historic Scotland. Only one project is hosting their outputs on a commercial site; in this case that of the firm that did the programming. Overall, only 23 projects (the Other specialist centre, Other, and Commercial categories) were hosted outside the university sector (not counting the AHDS).

The choice of hosts was dictated by a variety of considerations, and was not always a straightforward issue. The on-line catalogues were more likely to choose an obviously

secure host such as their own university library, the British Library (6 projects), or The National Archives. The majority of on-line searchable resources are hosted where the PI is employed, but some had special requirements that affected their choice of site. For example, a couple of projects were so large they were forced to look outside their institution for server space. Others took matters into their own hands and purchased a dedicated server, but this was not without difficulty: one project discovered that despite having its own server, the university's system was not technically equipped to provide backups. Subject specialist centres were chosen where they are available, such as the BUFVC (4 projects) for film and video. In the case of AHDS visual arts (3 projects), projects obtained technical expertise as well as website hosting. Mounting a digital resource together with other resources in the same subject helps to ensure wider accessibility; more use of the site overall in turn fosters a greater possibility that the site will be maintained.

A solution employed by some projects was to deposit their work in other countries. As the academic community is international in outlook, it doesn't really matter where a website sits physically. Access took priority over location or nationalism; the PIs wanted to host a website where it would be most easily discovered and best maintained. Two projects will be based at sites in the USA, in the one case because 'it is the most established, permanent, best-funded web resource in our scholarly field'; if the resource had been held on the home university's website it might not have been discovered or used. Only a couple of projects were able to report that they would be maintained in their university's Digital Repository. While we hope this will become more common in future, most repositories do not yet have the resources to maintain anything more than e-publications, or text files. Certain universities are better equipped – financially, technically, and policy-wise – to take on these long-term hosting arrangements: Durham, Glasgow, and Cambridge, for instance. It would appear that outputs associated with top-flight/wealthier institutions have more secure future than those which are not. A precaution adopted by some was that of hosting the main site at the PI's own university, and mirroring this at another institution, either in the UK or in another country.

Technical Sustainability

Technical sustainability involves the provision of an appropriate digital environment to host a resource and updating the resource's technical format as the environment is updated around it. On-line resources are likely to require some degree of updating within five years or so of their creation if they are to retain their full functionality. Most respondents were aware that this is an issue which required their attention, but responses ranged from an assumption that digital resources are easily and perpetually sustainable, to a distinct pessimism about the possibility of keeping the material available for even the agreed period of time. But a significant minority of the respondents appeared to be unaware (as far as we could see) that sustainability was an issue which required addressing. Nonetheless the overall picture is one of serious engagement with the issue.

The concerns expressed by PIs for the technical sustainability of their project varied considerably according to the type of host responsible for maintaining their digital resource. Table 3 gives the number of projects and proportion of the total with and without concerns in each type of hosting situation. With one exception, projects hosted at a university library were unanimous in not having concerns, which would lead one to believe that the university library is the safest place to house a digital resource (the one 'n/a' location indicates that the output was a CD/DVD—though of course these do not remain usable for ever). At the other end of the spectrum, two different hosting locations predictably caused worries for all respondents whose projects were housed there: these were the one case involving use of a commercial server, and, in view of its closure, the AHDS.

Having often found the assistance of the AHDS and its Centres such as the Archaeology Data Service (ADS) invaluable for the expertise they provided, respondents exhibited

concern about the loss of the AHDS and its impact on their projects. Some of the projects whose websites are already being maintained by the AHDS in their full functionality no longer view this as a viable way of assuring long-term use of their resource (though this is not a problem in the case of the Archaeology Data Service, which remains in existence as such). One project 'had allocated funds from AHRC grant to allow AHDS to do front-end of website and host at AHDS'; instead they have contracted with the UK Data Archive, and will also deposit a copy in their institution's digital repository despite the PI's worries that the latter site's functionality may be compromised. Strategies employed by these PIs to ensure access to their websites include partnering with web projects outside of academia, transferring their site to another server, and mirroring the AHDS-hosted site at another location. In one case the PI is lobbying his university for an Image Management System, in order to preserve the images in his project as well as others within the same institution.

Table 3: Concern with Technical Sustainability by Host Type

Host Type	Concern with Technical Sustainability	Number	Total	%
University other	Yes	23	53	43
	No	30		57
University specialist centre	Yes	10	20	50
	No	10		50
Other specialist centre	Yes	4	19	21
	No	15		79
University library	Yes	1	10	10
	No	9		90
AHDS	Yes	7	8	88
	No	1		12
Other	Yes	1	3	33
	No	2		67
Commercial	Yes	1	1	100
n/a	No	1	1	100

Opinions were divided for the three main types of host: 43% of PIs whose resources are in the 'University other' category expressed concerns, as did 50% in the case of those using university specialist centres, compared to a scant 21% with resources hosted at other specialist centres. Taken together, then, it would appear that PIs have most confidence in their university library to maintain their digital resource. Following closely are those with resources at external specialist centres. There is less confidence among those with resources elsewhere in universities. The fact that projects with resources in the 'University other' category showed slightly more confidence than those using University specialist centres may be related to the need in some cases to provide a continuing funding stream for the latter. We shall look more closely below at this and other types of worries PIs had regarding the technical sustainability of their digital resources.

As might be expected, concerns about sustainability also vary according to the type of resource, as Table 4 shows. On-line catalogues' – comprising 23 of the 115 responding projects – are the projects where there is the greatest confidence among respondents and which have the better strategies for sustainability. Of the 23, nineteen expressed no concerns for the technical sustainability of their digital resource. Their confidence that the project would be available in the long term was clear. For example respondents stated that they 'intend to maintain this resource indefinitely', that the 'catalogue will always be available and will always be fully functional'. Another 'catalogue of ... holdings will be available in perpetuity', and another respondent stated unequivocally that 'there are no foreseeable

circumstance at present which would lead to the resource's unavailability'. In the most emphatic answer, the respondent could 'foresee no problems short of global disaster for the catalogue entries'.

The reason that so many respondents are able to express such confidence is that plans to maintain these types of resources are often part of an overall institutional ICT strategy. Although funded originally by the AHRC, once complete they become part of a larger catalogue or system of catalogues which are the library's primary finding aid. They do not depend on individual PIs or additional funding. One project was characterized as part of 'mission-critical service delivery' which 'will be sustained'. In this case the respondent made it clear that such issues as the upgrading and updating of software were part of the institution's strategy. The respondent who put it most succinctly and relevantly stated that 'the catalogues, archival finding aids, and web site are incorporated into the Library's servers as part of its electronic infrastructure'. In some cases, the digital catalogue which was created by the project has replaced the printed catalogue as the means for finding and accessing library holdings. The respondent for one project said that it 'would not be in...the interest of the [museum] to discontinue this resource. It is now the only way to access library material, which has international importance'. Overall, resources which are integral to an institution's public face, such as digitized catalogues and other finding aids, must have a more secure future, while those which are more reliant on individuals are at greater risk.

Table 4: Concern with Technical Sustainability by Output Type

Output Type	Concerns with Technical Sustainability	Number	Total	%
CD/DVD	No	1	1	100
Downloadable	Yes	2	8	25
	No	6		75
Online catalogue	Yes	4	23	17
	No	19		83
Online searchable	Yes	41	83	49
	No	42		51

Whereas the on-line catalogues were fairly unanimous in their confidence in the sustainability of their web resource, the largest category of respondents - the 83 on-line searchable projects – were not nearly so confident. These projects usually include a substantial database and a complex user interface, both of which require significant technical support, as well as periodic updating of content. Unsurprisingly, the more complex the system is, the greater the potential for problems. Our impression is also that many of these projects did not plan in detail from the beginning how to sustain their site.

Approximately half of this category (41/83) expressed concerns about the future of their project once the funding period is ended. Of those who expressed no concern, some had strategies to deal with sustainability issues, but others made no mention of anything of the kind. We can only speculate whether the omission was due to lack of awareness of the gravity of the issue or simply to not having time to go into detail when replying to our questionnaire. For many researchers, the stated aim is to keep their project 'available indefinitely' and they look to be able to sustain the resource 'forever'. One respondent wrote 'The site is expected to be available and fully functional as long as the University of *** exists.' Without detailed follow-up, we cannot say how well-founded this confidence is.

Taking all categories of output type together, a frequently expressed worry was the short-term nature of hosting contracts with external providers (10 replies), and some are already looking for alternative locations. The length of contracts with external providers

varies from one year after the end of AHRC funding to eight years from the beginning of the project. Others (8 in all) expressed concern at the absence of funding for technical support after the end of project funding, and six anticipated problems with the payment of future license fees for images and other material. Five projects cited staff leaving as a difficulty: projects are typically put together by a team including computing specialists, and when funding ends the team disperses. There are cases where no one other than the computing specialist knew how the system worked: 'if ..., the project's technical consultant, were to become unavailable for any reason it is hard to see how the resource could continue to develop at anything like its current pace'. In some cases both technical and academic updating are continued by academic PIs on a voluntary basis, but some expressed concern as to what would happen after their retirement. One respondent observed that 'Technical sustainability will depend on the willingness of the department to host the websites'. As we shall see, many respondents felt that the technical support provided by their institution was insufficient for their needs.

One PI noted that 'While we have funding, the database and website is maintained by a part-time project technician employed one day a week'. In some projects technical updating takes place using funds (and sometimes staff) from later projects. Interestingly, only one respondent reported how much continuing technical maintenance costs: 'The running costs are estimated at £3600/yr which we hope to cover in the course of subsequent research projects based on this resource.' A few universities have a dedicated member of staff to take care of web resources mounted on the university website. In one institution a dedicated member of library staff was hired on a 0.5 contract, with responsibility for updating all the university's on-line archives and databases; the half-time post was not nearly sufficient for the task. Sometimes help is obtained from the institution's Computing or Informatics Departments.

Two comments by PIs are worth quoting at length, because they give particularly forceful expression to concerns expressed by many. The first concerns a resource that is particularly challenging in technical terms, as many are, and highlights the difficulties raised by the need for updating as the digital environment is updated.

Despite it being hosted by the university library computing services, we have grave doubts about its sustainability. In fact, we have been informed by the head of the library computing services that its life expectancy is now no more than five or six years. Because this on-line publication employs software (and very complicated software) purposely designed just for this project, it will not (we are informed) be able to be easily upgraded to remain functional when a new platform is installed for the computing system (which they anticipate will occur in about another five years, possibly less). In order for it to be maintained in a functional state, a full-time computer programmer would need to be employed for an extended period of time. Given the extraordinary demands on the budget of the ... Library, it is highly unlikely indeed that the required funds would be directed to this matter. Thus, despite the good intentions of the ... Library and the University, and the expertise and helpfulness of the staff of the university library computer service (who have at all stages been most helpful and professional), the life-expectancy of this on-line publication will be quite short.

The second, from a very senior and experienced PI, concerns the lack of institutional incentives for sustaining resources of this kind.

But I am deeply concerned that at present institutions appear to receive no 'brownie points' for maintaining a resource in this way... For this and for my other on-line publications I am profoundly concerned about the future, at least within the UK, following the closure of the AHDS: I see no evidence of commitment in this country to making such things available in the long-term, and I am investigating the possibility of transferring responsibility to institutions in the USA... It would be very sad to see an

entirely British-funded resource transferred in this way: but the intellectual content is more important than national pride.

Academic updating

A key advantage of online resources is that they are often far more easily and economically updated than print materials. Nevertheless keeping online projects up-to-date is neither free nor without problems. In addition to technical sustainability, the questionnaire asked if updating of the resource's academic content was to be undertaken and how this would be managed. As Table 5 below shows, projects which did not require academic updating are in the minority; the vast majority (92/115) do require some updating. Of these, there was a roughly equal distribution between those that envisage difficulty with this and those for whom updating is straightforward. For most of those that envisage difficulty it concerns the availability of funding to make it possible to carry out the work.

The updating of the content of on-line catalogues is often part of the institution's strategy for allowing access to its materials. Some resources are catalogues which will require little or no updating, because they are finding aids for fixed collections. Those that do require updating are likely to be maintained as part of the library's ongoing work, as with any catalogue: 'catalogue records will continue to be added for the new acquisitions'. In another case, 'all new books/magazines to the Library are added to the catalogue'. Quality is maintained 'by a professional librarian' and it is part of the remit of staff to carry this work out. A minority of these on-line catalogues raised the need for additional funding to enable updating to take place. For one respondent significant changes to the resource are not 'anticipated', but if any were necessary it 'would require more consideration of resource implications'. Another wrote that 'the site could only be updated were funding to be available for such a process'.

Table 5. Number of Projects that Require Academic Updating, by Output Type

Output	Academic updating	Number
CD/DVD	No	1
Downloadable	Yes	6
	No	2
On-line catalogue	Yes	19
	No	4
On-line searchable	Yes	67
	No	16

For the majority of on-line searchable database projects academic updating was an important issue. This includes both updating of the underlying database, and tweaking and correcting the website interface. 67 are doing this or have plans to do so; the remainder told us their resource would not be updated for one reason or another; or returned null responses--the question was not always answered. One project stated that it had never expected to finish working within the funding period. As with technical sustainability, academic updating of a finished project can also be funded from new projects. A common method is for the PI and/or members of the project team to do the updating on a voluntary basis: this has the advantage of a keen and interested party being on hand to do the work; and the disadvantage of there not being anyone else if the staff in question leave. One project estimates that 'Although not officially in anyone's contract currently, there are ca. 15 people working to ensure the site's continuity'. Enthusiasm and commitment are clearly evident. One team has been updating their project's website since its launch in 2005, despite opposition from their department. In at least one case staff not involved in the original project are used.

Alternatively, users are expected to help update the site, with editorial approval. One resource, which forms part of a Master's course materials, intends to have updating done, or significantly helped, by the students. In about ten cases responsibility for updating content has passed to the host, often an external one, once AHRC funding has ceased: updating will be not be done by members of the project team, but by experts employed by the host of the resource. The rarest category was that where funds for updating the resource were allocated within the original AHRC grant.

Usage Statistics, Publicity and Promotion

In response to our query, over half the respondents to our questionnaire (65) said they were collecting usage statistics for their web resource, or had plans to do so once the site went live. Two projects also had plans to follow up on research findings or publications that referred to their resource, whilst one was using Google Analytics to track usage. The main reason for not collecting this type of data from the website was not thinking about it from the outset; a couple of PIs noted that they had difficulty in doing so due to technical difficulties within their institution.

Several projects commented that there had been media interest in their work, in either newspapers, or television. For one team, publicity was the 'responsibility of all project partners. It includes a two-day conference in London, a TV documentary, and exhibitions in all the partner libraries'. One project 'will feature next year in an episode of "Who Do You Think You Are" with an audience of 6 million'. At times the host takes over the publicizing role. Many PIs publicise their work to their subject communities, particularly if it is a highly specialised type of resource. But there are also those that haven't publicized their resource at all. The following comment sums up fairly well the opinions of many PIs in this group: 'We should publicise all aspects of our work, including this resource, more than we do. Again it comes back to a question of resources for staff-time. Within a limited budget, we are probably more likely to prioritise updating and correcting over advertising.' These are, after all, academics, not marketing experts, but therein lies the rub. In many cases problems with sustainability and related matters are due to tasks being left to academics which they are not fully qualified, and/or do not have the time, to carry out.

Institutional Support

We asked PIs to comment on the technical support provided by their institution for their digital projects, and then categorized their views on this from None (i.e. No Support) to Excellent. The responses are tallied in Table 6. Using our categories, one-third of the respondents thought the level of support they received from their institution was Excellent. Of these 34 projects, only 23 are hosted at the PI's own university; although the remaining eleven PIs found their own institution's IT support excellent they chose not to mount their digital resource there. 16 of the 23 that rated their university support Good found a home for their digital resource within the university, as did 19 of the 28 projects that rated the support Acceptable. Thus projects' reliance on their own university's website remains fairly consistent whether the level of support is rated Excellent, Good or Acceptable. In the two lowest ratings, however, there is a marked drop, as only 8 out of 19 projects in the Minimal category and 2 out of 5 in the None category were mounted in the PI's HEI.

Two responses under this head are worth quoting at length, one from a leading research university.

- It could be considerably better. There is a willingness to try and accommodate and support the work, but a definite lack of experience and expertise in terms of developing, working with and support such projects. In my own school there is not readily available technical expertise I can draw on to get advice about how to do or sort out fairly basic things – e.g. like arranging backing up on the server, arranging for a dedicated info@

email address that can be redirected to my own email account, advising on the installation of the server. It has been a learning curve and uphill struggle all the way so far. And again, very time consuming for me. It was therefore *infuriating* to read that part of the AHRC's rationale for defunding the AHDS was that the necessary expertise now exists in HE institutions. This has simply not been my experience.

- The university has neither means nor personnel nor know-how to continue maintenance without external funding, and if the funding is discontinued the site will disappear.

Although we did not ask about the institution's policy for dealing with digital resources, this would perhaps have been a good idea, for it would appear, from the difficulties noted by the PIs, that many HEIs do not have a policy in place for maintaining digital resources produced with funding council money. As mentioned by one respondent, there seems to be little incentive for universities to maintain these complicated websites.

Table 6: Rating of Institutional Support

Level of support	Number	Projects at PI's own HEI	% at PIs own HEI
Excellent	34	23	68%
Good	23	16	70%
Acceptable	28	19	68%
Minimal	19	8	42%
None	5	2	40%
Not Answered	6	2	34%
Total	115	70	61%

Conclusion

The following responses are also worth quoting at length.

- I think the withdrawal of support for the AHDS is a misguided step which threatens both the lasting value of investment already made into digital resources for the humanities, and the UK's pre-eminent reputation in this area; I think the assumption that institutions are able to provide the necessary resources and expertise for long-term maintenance is incorrect.
- We have raised the matter of sustainability repeatedly at international level with sister project teams, and everybody shares the same concern, that what are meant to be, at least in part, conservation projects, are in fact producing web-material of very limited durability - at least at the level of proper functionality. Raw data preservation (using XML) is less of a worry.
- AHRC have been prepared to fund projects that require large IT resources (e.g. storage) but not to fund the IT infrastructure (e.g. storage) to support them, expecting the host universities to take on substantial commitments. There is often no way for these commitments to be budgeted for, and so an unknown number of project proposals can never even be submitted. The AHDS allowed us staged delivery of master copies of uncompressed data that relieved our pressure on storage, this was a considerable saving financially.'
- I am interested that you are still collecting information on this matter. It became evident in 2003-4 that this would be a problem for my project, and I formed the impression that I was not alone: other Resource Enhancement projects were encountering similar difficulties. I think the answer to these difficulties is two-fold. First, funds must be

included in any grant towards the cost of the construction and maintenance of a Digital Resource. Second, the AHRC should develop and sustain its own website where these projects could be located. That would solve many individual difficulties and would add lustre to the AHRC by drawing attention to all the good work it has supported.

Highlighting these comments is, of course, to emphasize the difficulties that have been reported in the matter of sustainability, at the expense of the more confident and positive responses we have recorded. As we have seen, concerns about technical sustainability are expressed by 47 out of the 115 respondents, and are largely limited to half of the projects in the on-line searchable category. The need for academic updating was registered by a much larger proportion, indeed the great majority of projects: 92 in total. However the latter issue is arguably less important than the former: if technical sustainability fails, then the resource as a whole ceases to be available, whereas the absence of academic updating merely reduces its value over time, sometimes only slightly.

How many of the reported difficulties with technical sustainability will result in significant resource failure is impossible to predict at this stage, just as we cannot be sure how much the confidence of many respondents will be justified in the longer term. What we can say, however, is that there are serious grounds for concern about the future of a substantial if still unquantifiable number of Resource Enhancement outputs, and that the AHRC would be wise to give further thought to the means by which these might be addressed: for instance by providing a modest funding stream to pay for technical and/or academic updating, or to provide one-off payments to cover the cost of deposit at a host that could assume responsibility for updating. Otherwise there is a real risk that a significant part of a major public investment of funds may have produced only short-term benefits.

There are also lessons to be learnt from all this about future data creation projects, a substantial number of which continue to be funded, now that the Resource Enhancement scheme is finished, through standard research grants. The Technical Appendix needs to be strengthened to provide stronger guarantees of sustainability and to ensure the adoption of best practices; this might best be applied only to data resources intended for publication and re-use, as opposed to data outputs that are only subsidiary to the project's research, for which a reduced Technical Appendix could be used. In the former case, applicants should also be encouraged to make full allowance in project budgets for the cost of optimizing resources for preservation and re-use, including possible one-off payments to cover long-term hosting and updating. Steps need to be taken to encourage the use of appropriate advisory services by applicants, since it is clear that the required level of expertise is not available in most institutions. Applicants should be encouraged whenever necessary to make centres of expertise outside their institutions funded partners in their projects, thus helping to ensure that they received the necessary technical advice both at the application stage and during the life of the project. This has been the practice of a number of Resource Enhancement projects, and ought to be extended more widely.

SETH DENBO
HEATHER HASKINS
DAVID ROBEY
December 2008

APPENDIX I: the Questionnaire

AHRC Resource Enhancement Project Sustainability and Value Questionnaire

Please insert your answers below each question. The statements you make will be treated as expressions of opinion and not as any kind of commitment. The individual sources of the views expressed will be kept confidential to the ICT Programme office, and all reporting will be anonymized.

1. Description. Please describe briefly the content and purpose of the resource.
2. Availability. How is the resource (to be) made available? Please give the site where it is or will be maintained, and say who is responsible for the site. Have you had or do you foresee any problems finding an appropriate site for it?
3. Technical sustainability. How long do you expect to keep your resource available and fully functional after completion? What steps will you need to take to ensure this? Please specify any problems or issues.
4. Academic updating. What steps are you taking / will you take to keep the academic content of your resource up to date after it is completed? Please specify any problems or issues.
5. Evidence of value. In order to encourage further support and investment, it is vital to collect concrete evidence of the value of digital resources. Please indicate briefly any evidence you have of such value, in the form of significant research findings by you or anyone else that your resource has made possible.
6. Usage statistics. Are you collecting usage statistics regarding your resource? If so, please mention any significant findings.
7. Publicity and promotion. Have you taken / will you take any steps to publicize and promote your resource, particularly after the end of the AHDS? Please specify.
8. Institutional support. How adequate is the technical support available in your institution for your digital resource work?
9. Any further comments/issues.

THANK YOU FOR ANSWERING.

DAVID ROBEY
September 2007

APPENDIX II: Specialist Centres

University Specialist Centres

- Ashmolean Museum, University of Oxford
- British History Online, Institute of Historical Research (IHR), University of London
- Centre for Computing in the Humanities (CCH), King's College London
- Centre of South Asian Studies, University of Cambridge
- Hamilton Kerr Institute, Fitzwilliam Museum, University of Cambridge
- Humanities Advanced Technology and Information Institute (HATII), University of Glasgow
- HRIOnline, Humanities Research Institute, University of Sheffield
- Institute of Textual Scholarship and Electronic Editing, University of Birmingham
- National Cataloguing Unit for the Archives of Contemporary Scientists (NCUACS), University of Bath
- Oxford Text Archive, University of Oxford

Other Specialist Centres

- British Library
- British Universities Film & Video Council (BUFVC)
- Museums Libraries & Archives (MLA)
- Portable Antiquities Scheme (PAS)
- Repertoire International de Littérature Musicale (UK branch)
- The National Archives
- UK Data Archive