



JISC Project Plan

TAG: Transatlantic Archaeology Gateway

Overview of Project

1. Background

On both sides of the Atlantic, the discipline of Archaeology has been a relative 'early adopter' of ICT in teaching and research, particularly when compared with other arts and humanities. Archaeologists routinely create vast quantities of primary digital data, in a rich variety of formats, including structured and unstructured text, spreadsheets and databases, still and moving images, CAD, GIS, landscape and object-scale 3-D scans, and virtual reality models. Although digitisation is important for legacy data sets, much of this primary data is already 'born digital'. As the only record of unrepeatable fieldwork it is essential that these data are preserved, for re-use and re-interpretation. In the UK, the Archaeology Data Service (ADS) was established in 1996 and has developed into a national repository for all digital data from the UK historic environment sector, crosscutting the academic and public and private sectors (<http://ads.ahds.ac.uk>). In the USA, it has taken longer to establish a national archival infrastructure but in December 2008 the Digital Antiquity initiative and its digital repository, the Digital Archaeological record (tDAR), was established at Arizona State University, with generous funding from the Andrew W Mellon Foundation. Digital Antiquity's scope also includes archaeology in the private, governmental, and academic sectors.

The primary aim of this project is to develop tools for transatlantic cross-searching and semantic interoperability between ADS and tDAR. This will not only provide a sustainable service for archaeological teaching, learning and research across two continents; it will also provide an exemplar for international cyber-infrastructure partnerships between North America and Europe, across all subject areas. Archaeological research is, by definition, international. For most of the human past modern political boundaries were irrelevant. The 'big questions', including hominid evolution, the development of agriculture and sedentism, the growth of complex societies and urbanism, human impact on the environment and so on, all transcend the modern political map. In order to pursue an understanding of major changes and to investigate whether these follow independent evolutionary trajectories or stem from diffusion or migration of people and ideas, it is necessary to have access to data sets which cross countries and continents.

In the UK, the ADS provides online access to over one million metadata records covering the archaeology of England, Scotland, Wales and Northern Ireland. These are brokered on behalf of national government agencies, local government Historic Environment Records, and amenity and period societies and other specialist databases. In addition these 'thin' metadata records provide a resource discovery layer which sits above much richer 'thick' archives. These include over 300 fieldwork and research project archives (covering many hundreds of excavations), over 3000 grey literature reports, and over 2000 digitised journal articles. The archives collected since 1996 represent the key digital research outputs which have been generated by university-based academics, as well as a growing number of commercially sponsored excavations. The ADS has a mandate from the AHRC, NERC and English Heritage, amongst others, to provide a digital repository for all outputs from research they fund.

In the USA, the National Science Foundation funded prototype development for tDAR. As a part of this prototype development, tDAR now has data from a number of large cultural resource management and academic projects across the US Southwest. The newly awarded Mellon

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Foundation grant includes funding for further software development directed to key data preservation and access issues and \$225,000 for minigrants (within the next two years) that would fund the registration by independent researchers of a substantial number of valuable sets of legacy research documents and datasets. Further, Digital Antiquity is already working with US government agencies toward policies that would mandate deposit of documents and data associated with federally mandated, funded, or permitted projects. As there are on the order of 50,000 federally mandated cultural resource management field projects executed each year, tDAR's capture of data and documents from even a quite modest fraction of these projects over the course of the proposed JISC/NEH grant (as expected) would result in a quite substantial archive. tDAR holdings are and will remain primarily focused on archaeological work in the US and on academic research elsewhere by US scholars. As a part of our prototype development, tDAR has already ingested 360,042 bibliographic records from the National Archaeological Database (NADB), of which 308,209 describe unpublished grey literature reports.

2. Aims and Objectives

The TAG project will develop an infrastructure to support, bring together and enhance digital content funded in the USA and England/Wales. It will build initially on existing web services registries maintained by the ADS for the historic environment sector in Europe and extends these for North American usage. A web services application will then be developed to create a standards-compliant cross-search facility for metadata records held by ADS (for the UK) and tDAR (for the USA) covering the archaeology of England and the United States. In a second stage a richer and deeper web services cross-search facility will be developed for faunal remains databases in England and the USA, providing an architecture to enable deep data mining as well as a valuable research tool for archaeologists in the UK and USA. Having been established in two national digital archive services, the long-term sustainability and promotion of the service is also secured for future development and enhancement.

3. Overall Approach

TAG will develop interoperability between the USA and UK at two levels. The first stage will be to create infrastructure to enable basic cross-search of Dublin Core compatible metadata records for digital resources covering the archaeology of the USA and UK. This is relatively straightforward in that the EU-funded ARENA project has already demonstrated it is achievable within Europe, and the ARENA portal is now being taken forward as an exemplar of a web services architecture solution within the European Strategy Forum on Research Infrastructures (ESFRI) roadmap under the aegis of the EU DARIAH consortium. Nonetheless, mapping European to North American metadata schemes will provide some challenges, particularly for periodisation and subject type. The second stage will attempt to develop a much deeper and richer level of cross-searching for faunal data from North America and Europe. This sub-discipline has been chosen as there is a relatively high level of agreement over basic classifications; the provision of deep data mining would be truly ground-breaking.

4. Project Outputs

There will be three significant outputs from the TAG project: (a) a standards-compliant web services registry for historic environment information resources which spans two continents, with agreed tModels for sites and monuments metadata records and for faunal datasets. This will define existing web services, allow researchers to add new services, and catalogue which web services are available to other aggregators. (b) a transatlantic gateway which will allow researchers to query for the existence of sites and datasets on both sides of the Atlantic by what, when & where attributes (c) a web-based tool which will allow researchers to combine and interrogate in depth faunal assemblages from both continents.

In addition to above tangible outputs the TAG project will help build capacity for similar interoperability projects on both sides of the Atlantic by helping develop and nurture the necessary skill sets in the UK

and US archaeology contexts. Other intangible benefits that are expected to arise from the project are the strengthening and focussing of sub-domain specialist groups (in the first instance faunal remains specialists) through the process of consensus building around data standards, this has the added benefit of raising awareness of broad data management issues not that may not ordinarily feature in the discourse of archaeological material specialists.

5. Project Outcomes

The TAG project will allow archaeologists to attack a range of new research questions using existing digital resources. Take for example, a researcher interested in the origins of domestication. Using the TAG they would be able to locate sites of relevant archaeological cultures and date, and identify suitable datasets for their research project, whether held in the UK or USA. Although based in the UK, the ADS holds several international datasets. Similarly, tDAR already holds or has in place agreements to archive several important datasets from Latin America, generated by both US and Latin American scholars. Next the researcher could simultaneously interrogate datasets from across the globe to look at the comparative effects of domestication on animal species, e.g., comparing strategies for selective breeding and culling or differential species changes. One could compare changes in animal husbandry practices in colonial period North America with those occurring at the same time in Europe. For earlier periods, researchers could explore the combinations of demographic, organizational, and ecological circumstances that led either to sustainable access to given species of wild game, or alternately led to the depression in numbers or even extinction of overhunted animals. A particularly intriguing, global-scale faunal issue relevant to the colonial period is the hide trade mobilized to meet enormous demands for leather in Europe. A worldwide examination of changes in hunting practices and the raising of domestic animals in response to this demand would be particularly exciting.

The datasets that will become internationally discoverable through TAG project will also have research value to scholars in other disciplines. Archaeological deposits are typically very well dated relative to the time scales and temporal information usually available to, for example, geologists or palaeontologists. Archaeologists typically amass large and diverse faunal assemblages from time periods that pre-date the widespread ecological and landscape changes that have occurred during the past 400 years (in the Americas) and that predate late Pleistocene extinctions on both continents. Those assemblages thus represent important comparative information for modern biologists and ecologists seeking to understand faunal biodiversity and more generally the structure and composition of the natural world.

In addition to the above examples of research impacts, the usage of resource discovery systems to find teaching resources such as exemplar material should not be underestimated. Experience at the ADS has shown that in addition to the academic research audience extensive use of our services and resources is made to support teaching and learning activities. This form of usage would be expected to expand to cover the gateway services and potentially have a significant impact on the availability of teaching resources particularly for faunal remains analysis.

6. Stakeholder Analysis

Stakeholder	Interest / stake	Importance
Academic researchers and research students	Primary consumers (and often producers) of TAG content will have greatly enhanced ability to directly discover relevant research resources and potentially to formulate new research questions. Amongst broader benefits, this has the specific benefit to the archaeological community of	High

	mitigating the intrusion of modern socio-political boundaries into research areas that pre-date these boundaries.	
Teaching academics and undergraduates	Consumers of TAG content will benefit from both broader range of content for teaching purposes, but also an example of enhanced archaeological data management across sub-domains (i.e. academic, governmental and commercial).	Medium
Faunal remains specialists (including educators)	The primary beneficiaries from WP3. 1) Agreed faunal remains resource discovery schema and data, reusable within the community. 2) the ability to immediately search and access faunal resource material drawn into the project as exemplar datasets (US and UK)	High
Digital Antiquity (tDAR)	International exposure of tDAR datasets via the ADS hosted aggregator and potentially any other service allowed to discover/consume the tDAR TAG service from the TAG Registry. The development of a web service specification that can be reused/expanded to encompass future data forms and/or aggregation systems.	High
ADS	The expansion of digital datasets and services available under the aegis of the ADS to include not just UK and European datasets, but US based data also in support of UK research objectives. Broader experience in the development of both web service specifications and web service aggregators and interfaces.	High
Broader digital repository community	Demonstration of data aggregation at both the domain resource discovery level and the sub-domain rich data level as an enhancement of repository dissemination functions (e.g. OAIS)	Medium
External aggregators	Where appropriate external	Medium

	data aggregators from other academic domains and/or from other countries could discover and consume TAG services, potentially benefiting both them and TAG participants.	
Non-HE archaeological community	The types of resource discovery services envisaged by TAG are extensively used (in their current un-aggregated form) by government, commercial and avocational archaeologists. TAG will enhance their research capacity as with the academic and post-graduate research base.	Low

7. Risk Analysis

Risk	Probability (1-5)	Severity (1-5)	Score (P x S)	Action to Prevent/Manage Risk
Staffing				
Project manager leaves before project is completed	2	4	8	The project manager is on an open contract with the ADS. This could allow a successor to be appointed without a significant gap. Project documentation to be kept up-to date and good communications with other project members maintained such that a change in staff would cause minimal disruption.
Key technical staff leave before project is completed	4	2	8	As above, however one key member of the project team (Stewart Waller) is moving and the process for replacing him is in train, fortunately this occurred prior to the major component of technical input required by this role and there will be adequate time for orientation of the new staff member.
Project team members cannot dedicate sufficient time to the project because of other commitments	2	3	6	The project team have committed to ensuring the project progresses.
Organisational				
Transatlantic communications prove problematic.	1	4	4	The internet based teleconferencing approach used in previous joint Digital Antiquity/ADS meeting has proved robust. An alternative approach relying on email only would also be adequate

				for the required collaboration if taken together with face to face meetings of team members already forecast (e.g. CAA, SAA and DA board meetings).
Stakeholders expectations greater than project can meet	2	3	6	Good communication with stakeholders, ensuring feedback and assisted by academic advisory role of the ADS and DA managements boards
Inability to define a faunal remains w/s schema	2	4	8	Careful negotiation with workshop participants to stress the benefit of a detailed schema, although agreement would be by consensus rather than formal process. A less detailed less rich schema could potentially be used to demonstrate the service/aggregation functions of TAG
Technical				
Software incompatibilities or failures (security)	2	4	8	All software selection and strategies will be based on open source software and/or using open standards to ensure compatibility. An ongoing informal technology watch of adopted technologies will be conducted to ensure any security issues are identified as early as possible and alternative software or other mitigation (e.g. patching) can be enacted.
Hardware (networking) inadequacies	1	4	4	Aggregation will take place linking two academic based networking systems with high bandwidth.
Legal				
Unforeseen IPR or licensing issues arise.	2	3	6	Usage agreements allow use of resource discovery metadata (WP2), existing terms and conditions of use challenges will come in to play before the point of download of datasets, ensuring all data se is for bona fide teaching learning and research purposes. No service would be made available for general aggregation (i.e. out ith the ADS interface) without ensuring notification of terms and conditions of use.

8. Standards

Name of standard or specification	Version	Notes
Dublin Core		OAI-compliant Dublin Core, open
MIDAS XML	2	Maps to CIDOC CRM, a transport format for

		where what and when data, open
ARENA gateway specification		Project specific, but open, forms core of TAG specification also open and the TAG Faunal remains specification
WSDL		Web Service Description Language, open
UDDI		Universal Description Discover and Integration service registry specification, open.
WGS84		Non-OS global latitude and longitude.
W3C Standards		For all web development, open.

9. Technical Development

At a generic level the project will conform to international metadata standards, including OAI-compliant Dublin Core. Within the cultural heritage sector there is a mapping between the ADS implementation of qualified Dublin Core and the MIDAS-XML standard for sites and monuments records. This in turn is mapped to the ISO standard CIDOC Conceptual Reference Model (CIDOC-CRM). Although MIDAS originated within the UK it is now being adopted by several other European countries. The tDAR environment consists of digital repository services based on the OAIS reference model as well as a data integration framework in which tabular data from registered archaeological datasets can be interrogated. Project- and resource-level metadata are represented and can be disseminated in OAI-compliant Dublin Core as well as the MODS metadata framework (maintained by the Library of Congress). Web services to be implemented by the project will be exposed via the Web Services Description Language (WSDL) and the SOAP messaging framework. The TAG Gateway specification which will be expressed as a UDDI tModel is necessarily domain (project) specific as there is no existing service allowing aggregation of UK and US archaeological resource discovery metadata.

10. Intellectual Property Rights

All ADS resources are deposited according to a common deposit licence (which has remained unchanged from the AHDS Deposit Licence and Common Access Agreement established with advice from JISC in 1997). Therefore depositors retain copyright but grant ADS a non-exclusive licence to disseminate both the derived metadata and the resource itself. Resources are free to use for teaching, learning and research throughout the world, so long as the copyright of the originator is acknowledged in any publication or reworking. All tDAR resources are deposited with a licence closely derived from the Creative Commons attribution license. The key provisions are that users are free to copy or distribute this content or to use it in derivative works so long as all use of this content is accompanied by with proper citation and attribution of relevant. Data access is free to all users and restricted only to specific content that in the US is considered sensitive, primarily the locations of archaeological sites that are not otherwise publicly available. It is not envisaged that the skeletal collections highlighted in Work package Three will raise any particular IPR, privacy, or ethical issues as human remains will be excluded.

The service specifications themselves (TAG and TAG Faunal remains) will be open and freely available at the end of the project.

Project Resources

11. Project Partners

University of York, Archaeology Data Service, Department of Archaeology.

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Contact, Professor Julian Richards, +44(0)1904433954, jdr1@york.ac.uk

Arizona State University, School of Human Evolution and Social Change. Digital Antiquity (tDAR)
Contact, Professor Keith W. Kintigh, +001(480)9656909 kintigh@asu.edu

12. Project Management

TAG project co-director (Prof. Richards) is also a member of the Digital Antiquity Board of Directors. He will meet with the other Board members annually. The Board will also meet at least bi-monthly the first year and quarterly thereafter via the Access grid, a videoconferencing technology which was proven during the Mellon project planning stage (see section one). This will provide the perfect mechanism for ensuring collaboration and undertaking project partnership during the JISC/NEH programme, at no additional cost. The existing ADS Management Committee and Digital Antiquity Board of Directors will provide external oversight of the project and advice which encompasses all stakeholder communities.

Day to day management of the project at the UK end will be undertaken by Stuart Jeffrey with the assistance where appropriate of Catherine Hardman. Regular project team meetings (weekly) for direct communication are envisaged and are easily facilitated as the ADS project team share offices in the King's Manor in York. Liaison with our project partners is as described above as well as via monthly Skype conference calls and frequent direct email contact between individual project team members here and in the states.

The Project Team (ADS):

Professor Julian Richards. He has overall control of strategy and finance, and takes a lead role in external liaison. He has specific oversight of the ADS/tDAR collaboration. As Head of the Department of Archaeology at the University of York Richards ensures ongoing support for ADS within the University, and provides liaison with White Rose repository development. He will spend 10 days on the project as UK Project Director. Jdr1@york.ac.uk

Dr Stuart Jeffrey is ADS User Services Manager. Jeffrey will act as project manager for the proposed workplan. He will spend 20% FTE on the project. sj523@york.ac.uk

Stewart Waller is ADS Applications Developer. Waller is taking a lead role in the development of the ADS ARENA2 project under DARIAH, and the proposed project provides a logical extension to this. He will spend 40% FTE per week on the project. (From December 31st this role will be undertaken by a named replacement, yet to be confirmed, due to staff changes). sjw143@york.ac.uk

Catherine Hardman is ADS Collections Manager. Her work in ADS involves day-to-day liaison with external agencies and field and university-based archaeologists, she will ensure that UK archaeologists engage with Work package Two. She will spend 15 days on the project. csh3@york.ac.uk

Donna Page is ADS Administrator and is responsible for the day-to-day management of ADS accounts and timesheets, ensuring staff time is charged to the correct project. She will spend 15 days on the project. dap4@york.ac.uk

The ADS will engage an external consultant in faunal assemblages to ensure community ownership of the faunal classification systems which will be essential for the success of Workpackage Two. This role will be undertaken by Dr Jane Richardson a locally-based specialist employed by Archaeological Services WYAS. She will be engaged for 10 days spread throughout the life of the project. Contact c/o csh3@york.ac.uk

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13. Programme Support

TAG may need support in helping find contacts with other relevant projects and to ensure that work done in the archaeological domain would facilitate, or at least be coherent with, any proposed larger cross-domain research data discovery and aggregation services.

14. Budget

The TAG proposal comprises budgets of £102,222 (c.\$148,700 at 20 March 2009) at the University of York and \$168,081 at Arizona State University.

In York there are 5 directly allocated staff whose time will be bought out to work on the project for a combined total of 44 person weeks. In addition 10 days of external faunal remains consultant Jane Richardson have been costed at her day rate of £280 per day. In ASU 6 members of staff will have a direct input to the project for a combined total of 36 person weeks. In addition a modest figure is included within both submissions in support of travel and expenses. Although we have demonstrated that we can hold effective project progress meetings using the Access Grid, we will need to travel to present the project at conferences, and for one or two face-to-face meetings of the project team in the United States. York has included within its budget 6 person trips at average travel costs of £400 per trip, plus 24 person days subsistence and US hotel accommodation at £100 per day.

A total budget of £3500 has also been allocated to hold a faunal remains workshop in York. This figure includes an allowance for room hire and refreshments (£500) plus overnight accommodation, travel and subsistence for up to 20 people @ an average of £150 per person. The ASU budget for Year 1 of the project requests funding for two trips to workshops in York. Costs are budgeted for roundtrip airfare and per diem according to current US State Department rates for three persons for four days; ground transportation costs are based on current train fares from London's Gatwick Airport to York.

All hardware and software costs are provided by the existing ADS and Digital Antiquity technical infrastructure and so is no cost to the TAG project. Similarly dissemination (via the ADS Newsletter and site visits) is not charged to the project.

At York the Estates and Indirect costs have been calculated according to the University FEC costing model, and the total York budget has been charged at 80% of FEC. At ASU fringe benefits rates are based on the basis of projected rates for the two fiscal years during which the project will be undertaken; indirect costs are calculated at the current rates established by the Department of Health and Human Services.

A full budget is attached as Appendix A.

Detailed Project Planning

15. Workpackages

Workpackage One,
Project management, evaluation and dissemination.

Workpackage Two.

During the first phase the ARENA mapping will be extended to encompass the US data model. Whilst this is relatively straightforward it is a substantial task as all period terms must be defined and all archaeological site types must be mapped to the Thesaurus of Monument Types. ADS will use its experience in Archaeotools and ARENA2 to create TAG: the Transatlantic Archaeology Gateway. This interface will allow users to cross-search metadata index records for archaeological sites in the UK and USA, using What, When and Where attributes. In addition ADS will agree on a Sites and monuments tModel with tDAR and extend the EU DARIAH UDDI to allow it to embrace North

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American hosted historic environment web services. Given the size and complexity archaeological provision in the US it is likely that eventually there will be several archaeological repositories and a common approach to implementing web services will be critical to allow these to be joined up.

Workpackage Three.

During Workpackage Three, a much deeper mapping will be developed to allow rich cross searching of faunal databases. ADS already hosts four distinct faunal databases but these cannot be combined and queried because of differences in structure and schema. Through the NSF-funded data integration work, the Digital Antiquity team has assembled databases from 21 major projects in the American Southwest (with two exceptions) recording more than 170,000 faunal elements. It is working with a team of expert faunal analysts from the US and Canada both in the context of a specific synthetic problem (having to do with faunal resource depression) and in reconciling (through query-time use of ontologies) the cross-project differences in the recording of faunal variables (e.g., taxon, element, completeness, and condition). In the context of working on this problem, these experts have helped identify key challenges for this deeper mapping for the faunal data envisioned for Workpackage Three.

Both projects will jointly develop and agree on a web services specification for faunal remains which will allow databases on both sides of the Atlantic to be interrogated. The resulting web service will be extensible and ultimately all faunal databases could be linked via TAG so long as they are prepared to create a web service which complies with the agreed tModel.

16. Evaluation Plan

Timing	Factor to Evaluate	Questions to Address	Method(s)	Measure of Success
October	Project Plan	Does the project plan reflect the original proposal, does the plan demonstrate a efficient and achievable route map for reaching the project goals?	Project plan submission	Acceptance by JISC.
Mid-project, Aug 2010	TAG Registry, TAG Service Specifications and the TAG Gateway	Is the functionality of the registry and gateway as expected/agreed?	Interim Report to JISC	Acceptance by JISC.
Ongoing	Project Web Site	Does this provide sufficient information, is it up to date.	Project manager monitoring.	The web site is visited, with little or no negative feedback, project partners and interested parties can access the required information from this site.
Ongoing	Dissemination actions	Are the actions, conferences and publications, appearing in a timely fashion and reaching the appropriate audiences.	Project Manager/ Management boards monitoring	Agreement with Project Manager/ Management boards
March 2011	TAG Faunal gateway services and refined gateway interface.	Is the functionality of the registry and gateway as expected/agreed?	Final Report to JISC	Acceptance by JISC.

	Dissemination Actions.			
March 2011 onwards	Gateway service usage and impact	Is the gateway service being used as, and as much as, expected? Is the impact of the services on research as expected?	Project Manager/ Management boards monitoring	Agreement with Project Manager/ Management boards

17. Quality Plan

Output: TAG Registry					
Timing	Quality criteria	QA method(s)	Evidence of compliance	Quality responsibilities	Quality tools (if applicable)
December 2009	Functionality	Project team review	Functionality demonstration	Project Manager/ Management boards	
Output: TAG gateway specification					
Timing	Quality criteria	QA method(s)	Evidence of compliance	Quality responsibilities	Quality tools (if applicable)
December 2009	Search Functionality	Project team / peer review	Functionality demonstration/walk through	Project Manager/ Management boards	
Output: TAG Faunal gateway specification					
Timing	Quality criteria	QA method(s)	Evidence of compliance	Quality responsibilities	Quality tools (if applicable)
July 2010	Search Functionality & Granularity (i.e. depth to which cross-searching might be facilitated)	Expert workshop review	Functionality demonstration/walk through	Project Manager/ Management boards	
Output: TAG Gateway Services (UK/US)					
Timing	Quality criteria	QA method(s)	Evidence of compliance	Quality responsibilities	Quality tools (if applicable)
June 2010	Content and availability	Project team review, user feedback.	Functionality demonstration	Project Manager/ Management boards	
Output: TAG Aggregator					
Timing	Quality criteria	QA method(s)	Evidence of compliance	Quality responsibilities	Quality tools (if applicable)

					applicable)
July/ December 2010	Usability and exploitation of service specification search functionality.	Project team review, focus groups, peer review.	Usability and functionality demonstration	Project Manager/ Management boards	
Output: TAG Faunal Gateway Services (UK/US)					
Timing	Quality criteria	QA method(s)	Evidence of compliance	Quality responsibilities	Quality tools (if applicable)
October 2010	Content and availability	Project team review, user feedback.	Functionality demonstration	Project Manager/ Management boards	

18. Dissemination Plan

The primary result of the project will be the transatlantic cross-search and resource discovery mechanism. This will be available to all users via the existing ADS and tDAR portals. This will already provide maximum exposure. The ADS web site is received 9,895,062 page requests from August 2007 to July 2008, from over 100 countries. This represents a minimum of 120,000 unique visitors, c.10% of which were from the USA. A number of enhancements are planned to be introduced during 2009, including an enhanced geospatial and faceted classification browser, which was piloted as a JISC Common Information Environment demonstrator, and further developed as part of the JISC-AHRC-EPSRC eScience Archaeotools project. This has incorporated natural language processing and data mining to provide deep access to ADS held resources. ADS resources are regularly promoted within the core HE/FE user community within the UK, particularly in workshops organised by the Subject Centre for Archaeology, History and Classics of the Higher Education Academy.

Equivalent statistics are not yet available for tDAR, which currently only provides a beta test service, but a substantial amount of the Mellon project is intended to promote dissemination, including the extensive mini-grant offering and the agency mandate efforts described above.

All the above dissemination activities are covered via existing funding sources.

In addition, the project partners will undertake promotion activities focussed specifically on the JISC/NEH collaboration, via joint presentations at major international conferences attended by UK and US archaeologists, including the Annual Computer Applications in Archaeology Conference (CAA), and the annual meeting of the Society for American Archaeology (SAA) which is regularly attended by over 3000 archaeologists. Funding is requested from JISC and NEH to allow key personnel to attend these meetings, which will also provide a further opportunity for project management and monitoring.

Timing	Dissemination Activity	Audience	Purpose	Key Message
April 2010/11	CAA Conference	Academic (international)	To promote the services and detail technical approaches.	Service features and availability.

April 2010/11	SAA Conference	Academic (USA)	To promote the services.	Service features and availability.
2010 - 2011	ADS News	Academic/government/local government/professional	TAG project updates	Service features and availability.

Finally, it is envisaged that in addition to the report to JISC/NEH there will be a number of publication outputs intended for the wider information science and digital humanities communities. These will highlight the methodologies used and lessons learned which may have significant cross-discipline importance.

19. Exit and Sustainability Plans

All project deliverables are intended to be sustainable after the life of the project, they consist of a collection of registries, specifications and services that will be maintained, promoted and made available via both the ADS and Digital Antiquity. The experience gained by both the management and technical components of the project team will in, in the case of the ADS, remain 'in-house' as all ADS personnel in the project team will continue to work with that organisation. It is envisaged that TAG will act as the springboard for a proliferation of services and sub-domain service specifications. Irrespective of such developments, however likely, the TAG gateway service and the richer TAG Faunal service should continue as a useful research resource. The activities outline in the dissemination plan should ensure that uptake in the stakeholder community is at the appropriate level.

Project Outputs	Why Sustainable	Scenarios for Taking Forward	Issues to Address
TAG Registry	Long terms UDDI service	Maintained by the ADS under the same regime as the HEIRNET and ARENA registries.	Management of the registry should be as automated as possible at the close of the project to minimise any overhead in maintaining it in the long run.
TAG gateway service specification	Reusable specification for future services.	Open specification made available for download/referencing on the ADS website. Full documentation will be required.	Minimal resources required.
TAG gateway service (UK/US)	These services are the most publicly visible and directly useful outputs for academic researchers	Service maintained by the ADS in the long term (minimal additional management time required)	Migration to new specifications would require further funding
TAG Faunal gateway service specification	Reusable specification for future services.	Open specification made available for download/referencing on the ADS website. Full documentation will be required.	Minimal resources required.
TAG Faunal gateway service (UK/US)	These services are the most publicly visible and directly	Service maintained by the ADS in the long term (minimal additional	Migration to new specifications would require further funding

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	useful outputs for academic researchers	management time required)	
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The ADS is itself a digital repository and all data and services held are maintained in a secure and (where appropriate) sustainable framework. The ADS endeavours to work within an Open Archival Information System (OAIS) framework. Three production servers are located within the controlled environment of the Computing Service machine room at the University of York. The servers are protected against hardware failure either through warranty or ongoing maintenance contracts with manufacturers. All production servers make use of mirroring of critical software systems to allow rapid recovery in the event of hard disk failure. Core services are also backed up to tape and stored in multiple locations under an agreement with the Computing Service. Data held by the ADS is further synchronised to an off site location using SSH tunnelling; an under warranty server located in the controlled environment of the machine room of the UK Data Archive (UKDA) at the University of Essex. To protect against disk failure the server is RAID configured with one hot swappable disk. This off-site repository is also backed up to tape by the UKDA and held in multiple locations. The above is expanded in a detailed Disaster Recovery Plan maintained by the ADS (available on request).

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Appendixes

Appendix A. Project Budget

Appendix B. Workpackages



TAG Project work packages

WORKPACKAGES	Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Work package 1:																			
Project Management (Inc.Tasks 1,2,4,13, 14, 19,20,21)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dissemination and Evaluation		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Work package 2:																			
ARENA Data model extension (Tasks 3,5,6,8)			X	X	X	X	X												
TAG Interface (Tasks 10,12, 18)								X	X	X	X						X	X	
DARIAH UDDI Extension (Tasks 6, 10)			X	X				X	X	X									
Work package 3:																			
Faunal data mapping (Tasks 7, 11)				X	X	X	X	X	X	X	X								
Consultation (Tasks 9, 11)					X	X	X	X											
Create Faunal web service (Tasks 15/16, 17, 18)												X	X	X	X	X	X	X	

Project start date: *1st October 2009*

Project completion date: *31st March 2011*

Duration: 18 months

Project Acronym: TAG
Version: 1.1
Contact: Stuart Jeffrey
Date: 30th October 2009

Workpackage and activity	Earliest start date	Latest completion date	Outputs (clearly indicate deliverables & reports in bold)	Milestone	Responsibility
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				Milestone	Responsibility
WORKPACKAGE 1: Project Management, Dissemination and Evaluation:					
<i>Objective: This package will provide overall management of the project and ensure that the outputs are delivered on time and within budget as well as managing dissemination to the stakeholders, JISC and beyond.</i>					
1. Deposit Project plan with JISC	1/10/09	31/10/09	Project plan		ADS - SJ
2. Add project web page to JISC web site	1/10/09	31/10/09	JISC project web page		ADS - SJ
4. Create project web site	1/10/09	31/12/09	Project web site		ADS - SJ
13. Supply data for interim report	1/7/10	31/7/10	Data supplied from DA to ADS for reporting purposes. Deliverables evaluation.		DA
14. Completion of WP2; Interim report	1/8/10	31/8/10	Interim report		ADS - SJ
19. Supply data for final report	1/1/11	31/1/11	Data supplied from DA to ADS for reporting purposes. Deliverables evaluation.		DA
20. Draft final report	1/2/11	28/2/11	Draft of TAG project report.		ADS - JDR/SJ
21. Completion report	1/3/11	31/3/11	Completion report		ADS - JDR/SJ

WORKPACKAGE 2:				
Objective: This package extends the ARENA tModel to encompass site based metadata from the US. It then creates a registry in which services adhering to this model can be registered and a gateway interface service in which cross-searching of the services can take place and the results aggregated.				
3. Circulate candidate WP2 tModel and schemas.	1/10/09	31/10/09	Circulation to project partners of draft ARENA 2 tModel specification documents (.xsd/WSDL) via website. This will be the core of the TAG gateway service.	ADS - SJ/SJW
5. Refine & agree tModel	1/10/09	31/12/09	Agreed TAG Web Service TModel	DA & ADS - SJ/SJW
6. Establish TAG web services registry based on the HEIRNET/ARENA 2 model.	1/11/09	31/1/10	Deliverable 1 - TAG Services Registry. A registry, Java based universal discovery, description and integration model (JUDDI) specifically for TAG services.	ADS - SJ/SJW
8. Map WP2 dataset (monument/site inventory data) to tModel	1/1/10	31/3/10	Ensuring that US based datasets adhere to the agreed tModel	DA
10. Create and register web service	1/4/10	30/06/10	Creation of a register TAG web service(s) adhering to the agreed tModel.	DA
12. Create gateway cross-searching interface	1/5/10	31/7/10	Deliverable 2 - TAG User Interface. A cross-searching service that discovers services via the TAG JUDDI, searches the according to the tModel and aggregates the results in a usable fashion.	ADS - SJ/SJW
18. User evaluation & modification of the interface(s) (also task WP3)	1/1/11	28/2/11	User evaluation of usability via formal and informal cross domain methods including focus groups.	ADS - SJ/SJW

WORKPACKAGE 3:					
<u>Objective:</u> This package is an attempt to extend the WP2 model from site/collection level data into site record level data, specifically faunal remains data. A new tModel will be developed to express this richer linking of datasets and an advanced gateway will be developed to facilitate cross-searching.					
7. Draft tModel created by leading domain/sub-domain experts	1/12/09	30/4/10	The creation a of a draft tModel to cover deep cross-searching of faunal remains databases on both sides of the Atlantic.		DA
9. User consultation of the faunal remains analysis community on both sides of the Atlantic via a workshop.	1/1/10	31/4/10	An invitational workshop for the faunal remains analysis community on both sides of the Atlantic, to evaluate and refine the proposed tModel (and underlying data/metadata schema).		DA & ADS - SJ/CSH
11. Final agreement tModel for WP2 based on the domain input from task 11.	1/5/10	31/07/09	Agreed Faunal Remains Web Service TModel		ADS - SJ/CSH
15/16. Create and register (in the TAG registry) the WP2 web service	1/7/10	31/10/10	Registered TAG faunal remains services X2 (UK/US). The creation of (at least) 2 registered TAG faunal remains services, one on either side of the Atlantic.		ADS - SJ/SJW
17. Create and refine user interface for WP2 (see also WP2 task 18)	1/10/10	31/12/10	Deliverable 3 - Faunal Remains User Interface. A cross-searching service that discovers faunal remains services via the TAG JUDDI (Task 15/16), searches the according to the tModel and aggregates the results in a usable fashion.		ADS - SJ/CSH/SJW

Members of Project Team:

ADS = Archaeology Data service (UoY), **DA** = Digital Antiquity (Arizona State University)

JDR = Julian Richards, **SJ** = Stuart Jeffrey, **SJW** = Stewart Waller, **CSH** =Catherine Hardman

