JISC DEVELOPMENT PROGRAMMES
Project Document Cover Sheet

Phase Two Summative Evaluation Final Report

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Phase Two Final Report: Evaluation of UKDA-StORe

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Content

1 Introduction

This document presents the final results of the phase two summative evaluation of the UKDA-StORe[1] project's portal repository system. After the completion of the regular funding phase of StORe under the JISC Digital Repositories programme in 2007 the project was granted an extension until mid-2008 to further refine the portal under the name UKDA-StORe. For the regular project a phase one summative evaluation assessed "the technical structure, functionality, design and quality of the demonstrator system, and the appropriateness of the 'common model' approach, using workshops to test the system with representative repository users"[2]. It was agreed to conduct a phase two summative evaluation to further assess the development of UKDA-StORe and to complement the findings of the first evaluation phase.

The phase two summative evaluation is based on a series of five expert user interviews to evaluate the StORe system in use. In the phase one evaluation it is stated, that "it is probable that a second complementary evaluation phase will be conducted in the future also based on the approach introduced here". This endeavour could be realised in general, but under other specifications: As the UKDA-StORe extension did not consist of a user base for the evaluator to draw on the approach had to be modified – from user evaluation workshops to qualitative evaluation interviews with domain experts – with the task to evaluate the system in regard to barriers and facilitators to use and usability issues unchanged.

Acknowledgements: The evaluator would like to thank the five interviewees for their valuable contributions and their support in testing UKDA-StORe and participating in the evaluation interviews.

2 Approach and Methodology

2.1 Objective and Method

Complementing the StORe phase one summative evaluation, this second phase is aimed at evaluating the UKDA-StORe repository portal concerning socio-technical barriers and facilitators to use and usability issues. To this end five semi-structured in-deep evaluation interviews have been planned and conducted with domain experts in the field of repositories, data and metadata – none of the participants had used UKDA-StORe before (one knew the phase one pilot predecessor, another had actually taken part in the phase one evaluation). The semi-structured interview guideline in Appendix B depicts the focus of the evaluation. Basically starting of the main part with the very much open question of "What do you think [of the StORe portal]?" gives opportunity to capture the initial reaction of the users to achieve feedback in form of direct genuine statements. The same question was used in the phase one evaluation after the evaluation testing session of the pilot and in both cases it lead to valuable statements. The order of questions follows the likely structure of exploring the system, which was already emphasised in the summary of the interview guide

[1] For an general overview of the JISC and CURL funded StORe project see http://jiscstore.jot.com/WikiHome, http://www.data-archive.ac.uk/randd/store.asp and http://www.data-archive.ac.uk/news/newsdetail.asp?id=1897 (aims of the extension)

[2] StORe: Phase One Summative Evaluation Final Report. Available under https://www.era.lib.ed.ac.uk/items-by-author?author=Poschen%2C+Meik

provided in the invitation email to the candidates. This group of questions focuses on system functionality and usability issues. The main part of the guideline closes with eliciting more complex opinions towards facilitators, barriers, collaboration and future use.

2.2 Interview Preparations

The UKDA provided a number of names of domain experts who might be prepared and suitable to test UKDA-StORe for the evaluation. The evaluator approached these candidates via email (see email outline in Appendix A) and with further snowballing could recruit five interviewees overall – the minimum number envisioned from the beginning to gather enough information to make a significant assessment of the system. Every interviewee was provided with a summary of the interview guideline and asked to explore the StORe system in preparation for the interview. The interviews took place between August and October 2008, an anonymised table of the interviewees with more information can be found in Appendix C.

3 Evaluation Results

3.1 Overview

The average interview time was 45 minutes (with the five interviews ranging between 29 and 61 minutes). Four were conducted via telephone and one was a face-to-face interview. All interviews have been prepared, organised, recorded (with the consent of the interviewee) and subsequently transcribed, analysed and for the purpose of any dissemination anonymised by the evaluator.

All users except one (the f2f interviewee, who otherwise provided very detailed information about exploring StORe) additionally explored the StORe system during the telephone interview, thus explaining what they were doing live. Those steps have been simultaneously reproduced by the interviewer on the other side of the phone line, a process which helped in supporting the users (giving some guidance when someone was stuck or had a question and explaining functions the user did not try out before), interacting with them (as in adding the interviewee to a project) and understanding or testing their points and issues better. This gave the evaluator a richer picture of the system in use for this evaluation in general. Furthermore three emails with additional helpful remarks from two users reached the evaluator after the interviews and two documented error messages have been provided.

The findings in the next section are summarised according to the semi-structured interview guideline, highlighting the for the evaluation relevant categories. One remit of this report is to evaluate the StORe system from an external point of view and thereby to disclose potentials for improvement in a constructive, user-driven way. As in being an external evaluation the evaluator is not aware of all technical or development related reasons which might apply to explain issues depicted here just by the current state of progress or wider design decisions.

3.2 Findings

3.2.1 General impression ("What do you think?")

All interviewees stressed that from their point of view as experts in the domain of repositories, data and metadata the StORe portal would be very useful for researchers from different disciplines in general as well as for users they support, for the following reasons:

- Its main asset is the preservation of data, which otherwise may get lost over time and providing a central point of reference for different institutions to store all kinds of data.
- To this end it helps to collect the necessary metadata for proper curation.
- It can be used as a project space to upload different documents and share them with collaborators
- Documents and data can be stored in the data archive with providing stable links from the beginning of the project
- Encourage people to curate and share their data by themselves in the future.
- Linking publications to your data "is obviously key to this whole package".

Two users had to a certain degree explored different releases of StORe since 2007. One of the users had participated in the first phase of the StORe pilot evaluation 2007 and found the current system much more mature and intuitive. The second user who had seen the phase one pilot, but was not part of the first evaluation also expressed quite a positive impression along those lines: "Having seen it move on from earlier versions it's coming on well and it's coming on a lot – and it's a huge amount of very good work to get this far."

The users emphasised that the portal is on a very good way, but not there as yet: "As an idea UKDA-StORe is a fantastic and wonderful idea", but right know it still "feels like a service for UKDA", how UKDA operates, "not a service by UKDA for researchers – which is a slightly different thing". Therefore it needs some more tweaking to become a system that people, and not only experts, would choose to use – and it has to be made clear, why people should put their data into StORe, what benefits they will get out of it.

Some more quotes of first overall impressions, which show the complexity of factors involved, as well as foci of the different expert test users:

- "It's a good idea; the legal side makes me a bit nervous. But basically I think it is a very good idea. I like the idea of a central repository. I find the front page quite difficult to read, but there you go."
- Another user found the system to be "all right, but nothing stood out particularly".
- "Yes, I didn't find it quite as easy as I hoped I would, I am actually not the best person investigating new bits of software, I do tend to find them confusing; but I don't suppose I'm the only person like that; (..) most users would be even less expert then I am."
- "It does not look quite exciting, it looks kind of boring; but at the same time I would not want pop ups all over the place. (..) If I had to use it, I would and could."

3.2.2 Finding information

Browse functionality

Three users stressed the importance of having more categories or faceted browsing/search as some kind of subject or content based ways of sorting, e.g. browsing "All Projects" whilst filtering by a specified term like discipline or University. The data in the list can be sorted by title, description or date (plus type when search results are displayed), but for two interviewees it was not clear at points why entries are sorted in a particular order and the small sort buttons are not clearly recognisable as such ("I am not quite sure why my project comes first – it is not alphabetically ordered, is that the latest one? (..) If you then try to order by description, it seems like it is not doing it properly. Not sure if there is something wrong there.”). For the description category the effect was reproducible. Users have been confused by the lack of a clearer display and unexpected behaviour of the description sorting mechanism in the evaluation. The sorting category in effect should be highlighted, starting with the default ‘Date Created’.

Search function

The search function (simple and advanced) was seen as quite straight forward functionality-wise. However the majority of the users pointed out that search results have not always been as expected, sometimes leading to no results, especially with the advanced search – this could be reproduced live during the interview. In one case the user’s own project could not be found every time in a reproducible way. The search functionality therefore seemed to be not completely implemented: “you would presume that it must be searching across the whole range of [metadata] fields”. Generally it would be good to explain in the portal, what is searched and how.

The search is deemed as necessary, as not everything can be found via browsing, especially with more and more content. Additionally, mentioned by two users, some functionality to fine-grain, i.e. filter the search results would be useful: “the more you offer the better” to get to the sought resources as quick and reliable as possible. One user summarised this general problem as follows: “It is ok. It is not very easy and it’s going to get quite unwieldy as more stuff gets put in.” The afore under “Browsing functionality” mentioned faceted browsing/search feature would further combine searching and browsing with more efficient semantic web functionality.

3.2.3 Displaying information

The general representation of information as in the design of the frontend with its icons and colour scheme was received well be all interviewees.

The first page (system home page) after login was addressed by two users explicitly. They recommended that instead of just ‘Add a Project’ or then the listing of own projects it would be better to see more useful information. This could include more about your own profile or actions (last searches, last resources with granted access) and most likely options as ‘Add a Project’, but also interesting system wide information. The latter could be news (what is UKDA doing, something UKDA wants to promote, event announcements etc.), newly added data or similar: “fill some of the space but with some interesting things”, which are useful to the users.

Another very important issue concerns the use of the access/no access symbols, one of the few real bugs in the system. Two users stated that displayed resources sometimes have a green access symbol (tick), but when the resource is actually clicked on, the access to the file is suddenly displayed as denied (reproducible example: the Power Point Deposit displayed in the search results for Spain): “That is very confusing.”

In the opinion of two other users, the display of information relating to a resource, e.g. a record marked as a publication/document, should be enhanced in the opinion of most of the users, e.g. by adding an abstract of a document. Furthermore it would be good to be able to see the actual number and format of files inside a resource on top otherwise every resource has to be clicked on to find out.

Some options the system offers do not make sense (“confusing”) unless you have something uploaded or in the review process, as pointed out by the majority of interviewees. They are not intuitive as long as you cannot see the concrete context or direction of that option. A line of text could help to explain this option. To put it another way, having displayed solely the ‘You have no items for review’ message is not the message users want to get, they want and should be encouraged to contribute.

Other useful improvements mentioned:

- It would be useful to get some information about what a project or deposit exactly is, e.g. popping up when you float over it with the mouse pointer.
- It might be useful if projects would have kind of serial numbers displayed, so it would be easier to point to a project, especially when more datasets will be up there.

3.2.4 Navigation

In general the navigation through the system, as observed by the evaluator in four of the five interviews by partially testing/exploring the system live synchronously, worked, but often took the users more time to orientate and more clicks to find the right page or option. The following comments of the interviewees mirror this observation.

Most users noted, that overall the same information often is repeated in terms of links and navigation, the screen is too packed, which also leads to users overlooking options like ‘myProfile’ on the top. The division between layers and other navigational elements is not supportive and should be improved in the future.

Three users stressed difficulties with missing navigational controls on the site itself in combination with the browser’s back button and different mechanisms implemented in the different levels of the tabs. The low level tabs are realised as Java scripts, whereas the high level tabs are page reloads – this can be very confusing if you expect it to work the same way with both mechanisms and the use of the browser’s back button (which works in one case and does not work in the other). One example are the “terms and conditions, if you don’t accept them you can’t get out again” – and even if you agree you will not be taken back to your last page, you have to close this window manually, which is also true for getting out of the ‘Help’ on top of the page.

This results in not being able to get back to the page you are coming from, but getting back to the home page and starting again, looking for the last page/dataset: “it is slightly irritating now, but would drive you mad once there is say 3000 datasets in there”. More navigational elements and aids have to be added, currently “it looks like some bits have been done, some just haven’t been done yet, they need to kind of smooth all that out”.

Some inconsistencies with the tabs have already been mentioned in this section. It showed that each user had problems with navigating by use of the tabs. All agreed that three rows would be too much making the display unclear and counter-intuitive (“could they get in one row, like in many other applications?”). Some users frequently had to return to the StORe home page again and start at the beginning, loosing time and effort. This makes it hard for (especially new) users to familiarise with the portal. The names of the tabs, on a positive note, overall have been perceived as straight forward – one user was not sure about the clarity of some of the names, especially the ‘All types’ tab.

The vertically displayed link-buttons which are displayed on some pages on the left hand side are meant to expand the menus for ‘File’, ‘Outputs’, ‘Manage’, with a ‘Hide’ button showing to fold again. The good idea might be, have a direct shortcut in connection to a functionality displayed in the main area of the page. All users had problems to realise that the buttons had a use in the first place, they did not like the approach to display them and they felt that the expandable menus merely duplicated options already displayed somewhere else:

- "It's taken me like ten minutes to figure out that this is one word and it was not referring to different things; what is f, what do they mean be i..?"
- "When you click on it, it says open menu, what menu, what are we talking about here?"
- "That is a bit confusing."
- "I did not see that initially; (..) the first impression is, it does not make sense"
- "And with that many fields at the top, there is no need to have this information at this place."

3.2.5 Login/ login explanations

One of the remits of the extension of StORe is the inclusion of a federated UKDA Shibboleth login, an improvement which worked conveniently without any problems for every user. Generally all domain experts found the register and login procedure and explanations to be fine and easy to use for themselves, to some degree because all have been familiar with this kind of mechanisms. The majority did not expect problems to arise for the "common" user, with one stating, that as it is now, the three different ways to log in might be "too much" for new users. Additionally one user remarked that by clicking the help on the login page people could get lost, as this links directly to the UKDA help and out of the StORe system.

3.2.6 Help function

Most users found the content of help explanations overall well described and fairly straight forward: "that's what you expect to find". It has some very good sections, explaining the different data formats, different terms – and "obviously it is very important to make sure the terminology is understood. (..) We should not assume that people using the system know what everything means."

At the same time users also would like to have a stronger focus on processes like: "How do I start a project? How do I upload a file and restrict access to some members of my research group?"

Three users saw potential for improvement in the way the help is presented, making it more graphical (currently all is represented only as text), with more visual aids, pictures, youTube-like demonstrations on how to do things and simple links to useful help resources outside StORe. As one user put it: "Everybody using the system would require some guidance at some point. (..) That's the key thing, if you look at these kind of sites today they have two or three videos on how you do key things. Two or three media files are better than 10 pages of text." The latter may be debatable, but a mix of media could improve the help section nevertheless.

Additionally some more dynamic elements are suggested by one user: "it would be good if hints would pop up while you do things."

Other topics mentioned by one to two users:

- The Help function on the right top was not noticed and used by two users, because it seemed to belong to the UKDA general site, as it is in the same colour and font as the UKDA scheme. After testing it: "It never crossed my mind to find e.g. the upload help here."
- One user could not find any help entry explaining 'Enable feedback for this collection': "I could not find out what it meant."

- Regarding the legal/ethical/IPR/anonymisation issues help section, one user noted, that the text would is fine to provide some basic explanations. But as those are quite complex and important issues, the user recommends embedding links to other resources on the web, as there is enough excellent material out there to point to (e.g. guidelines from the Data Curation Centre and information from the UKDA itself).

Note: During the last part of this evaluation the evaluator learned of another help resource provided by the Economic and Social Data Service (ESDS)[3] especially for ESRC researchers, which in part provides more detailed information on processes and terminology so far not accessible within StORe itself. This resource has not been included in this report as every interview had to be based on the same premises.

3.2.7 Terms and Conditions

Terms and conditions are essential to set the legal framework for a repository like StORe, which also allows users to share, submit and access diverse data. Experts and users alike have various sensibilities regarding such complex issues, this also showed in this evaluation.

One expert user did not get to look at the data which was accessible, because in order to be able to you first have to accept the terms and conditions, and those have been perceived as being "actually for depositors not assessors, so it asks me to confirm that I have intellectual property rights for the things I am about to view – and of course I have no intellectual property rights for the things I want to view. I mean I am a bit geeky, I read things and I refuse to tick them if they are inaccurate or untrue. They need to amend this for assessors as well."

Regarding the form and embedment of the terms and conditions in the system, different users pointed to the following:

- When you add/update something you have to accept the terms of use every time, which is a bit too much ("just a minor thing, but..").
- It should be possible to display the terms and conditions at will, i.e. to make them generally accessible and not only displayed as a result of a specified action in the system.
- A number of typos have been found in the terms and conditions.
- At the beginning it says 'I', later 'the contributor': it is unclear, if this is relating to the same person.

3.2.8 Metadata & metadata fields

In general, as experts in their field, all interviewees considered collecting metadata from the users and the process of harvesting it as one of the integral assets of StORe. From their experience, people seem to have to be brought into filling it in, with the concern, that the additional effort might put people off. So, as one user put it, the developers have to think about establishing a trade-off with the users. If you have them fill out too many fields and different pages they might not use the system in the end.

A very important general point mentioned by four of the five users concerns the metadata explanation texts which appear in the right column when a field is chosen to

[3] ESDS FAQ for ESRC researchers contributing to UKDA-store:
http://www.esds.ac.uk/aandp/create/storefaq.asp

edit. Those are too far at the bottom of the screen and there is blank space on top, so that users have to scroll down and away from the form. This makes the process tiresome and, more importantly, the explanations can easily be overlooked – which actually happened to at least three of the users. Overall the quality of the explanation texts was assessed as quite good. Nevertheless the majority stated that most of the metadata field explanations could be extended. In general more information (also as links) could be provided on the metadata/formats which has to be filled in, this information is already out there (on the web) and standardised. One user also mentioned, that wider explanations might be nice for the "common user", especially to explain why it would be important ("why am I doing is?") to have decent metadata for preservation in contrast to ending up with badly archived data. This could also include basic things like "what is metadata" – which is not a trivial question. Furthermore it was mentioned by another user, that the titles of the explaining text do not always match with the field titles, it would be good to have this clearer (e.g. 'Identifier' vs. 'ESRC grant number').

All users thought the process of filling in metadata for a newly created project was too intransparent and could be improved for different reasons:

a) After clicking 'save' all except one user for at least two tries did not discover the red error message on top, which states that data is missing and part 2 has to be edited.
b) This issue is grounded in the layout of the two part metadata editing page, which none of the interviewees saw right away in connection to the required fields.
c) Some users stated that there should be less required fields, as the main incentive has to be to get the users' data in, in the first place. But this may be a debateable claim as another user expressed: "it definitely makes you fill in the metadata".

Another interviewee used data from an existing "small side project" and in this case it was not "that friendly to use", getting that data in. A "lot of fiddly work and asking questions that I didn't particularly know the answers to" was necessary, "so I kind of made up", using some more or less random keywords at places. On the other hand, some of the information the system required was seen as useful.

The subject functionality, i.e. the 'Used Subject Tags' list which pops up at the right side with options to choose from was generally seen as a good dynamic and interactive way to fill in data. Also information which is already somewhere, as for the institution should be provided in a list to choose from – the information has already been entered somewhere and is stored in the database. This especially applies to data provided by the user before, like name/grant holder: "I had to enter my name again – this is the type of thing that you don't want, information which is already there, you want it to go automatically into the forms – if then it is wrong, you have to give the user a chance to correct it."

Diverse metadata issues:

- It was not clear to every user, what award title means exactly: title of the project? – and when creating a project this seems to be changed to award holder.
- Also it should be possible to enter more institutions than one (for multi-institutional projects).
- For the date period it is not clear in which date format it should be entered and also it did not check for false entries.

- It would be good to have some way to send/email a resources information/metadata to a person without having to copy the title and information out.
- ‘Description’: if somebody has not put in a description, ‘enter description of award comes up’. As this is not an required field it should be left blank.
- Legal and Ethical Issues: “the help says something about ‘Provide the details of consent with participants’, but I could not find a place where you could add that.” – this might be phrased not clear enough.
- Some metadata fields, including two mandatory ones, offer free text fields to enter data: One user noted, that from a library perspective maybe some more control would be good in terms of what is filled into those fields (in a standardised way), for consistencies sake (you might get a lot of different data). “It does not seem to enforce any structure” for the way data is filled in.

3.2.9 Processes

Creating a project

All expert users created a project in the course of the evaluation and found the process easy to follow. Two interviewees pointed out, that if StORe opens up to people not from the ESRC community, more information should be provided for this process (“Create ESRC project if you have an ESRC grant number, otherwise go to other projects”). In general for researchers not that familiar with these kind of tools things have to be much more intuitive.

Uploading data

The general functionality and the provided options have been appreciated as good and standard by all users. In the process of uploading data, one user pointed out, that the explanations have been confusing, as it reads: ‘To offer your research project to the UKDA you must (..) 2. upload at least one data and documentation sample, for qualitative data you must upload three data samples.’ – “Why? This does not make any sense to me, why more data samples for qualitative data, there is no description there, this is a bit weird.”

Contributing to a project

Two of the five users added to a project as a contributor without any problems. Both appreciated the email notification, but at least one would have liked more information in the email regarding the permissions of a contributor. This can be found in the help, but different levels of authorisation could be made clearer up front.

Managing users

All users looked this feature and found it generally useful, while three users tested it. One interviewee remarked, that this kind of functionality would be ok if you collaborate with a smaller number of people, but it would be good if you also could have groups of people for larger projects. And if you have several projects with the same groups of people you should not have to add those people on by one, again and again. A second user found this to be another type of useful functionality, which could be providing more fine-grained access rights for objects within a project.

For a third user again it was not clear who the listed users were, the user did not find this list very useful, as “it is most unlikely that the users already in the list are contributors to my project, how can I add someone who is not already in the list? (..) Can’t I do that until someone has already registered, so they have to register themselves before they can be added to a project” and “that would be a problem, because getting people to register for things is difficult" out of experience. In the users opinion it would help, if the person setting up the project could just put in the other contributors, kind of inviting them to the system (or just have them listed without a proper account).

Managing access/permissions

Most users emphasised the necessity of access rights and stated the good implementation of the related features in StORe, e.g. the notification email which is send to the users after giving them access to a resource ("Nice touch."). Another user granted permission to one of his files, was notified as well by a useful email, but found the URL which was send to him to access the file much too long with over two lines. It was also mentioned by one user, that 'myStORe' should have an option to list the resources to which a user has been granted access. Otherwise it may be difficult to retrospectively find a resource again – reliable only possible in searching for the notification email, which granted him access.

At the same time the user makes the point that the permissions will need some more refining in the future, when the number of users and objects will be very much higher. At this point it will not suffice to grant rights to every individual, but a group concept would have to be introduced, e.g. using shibboleth details, "so that for example you can give access to 'individuals', 'institutions', 'UK HE/FE', 'international HE/FE' and 'everybody'. Though UKDA may know of a more effective way to split the groups."

Submission process

This function has been used properly only by two of the five users, but everyone discovered it. In the opinion of most of the users this side of the system has to be clarified and advertised more, in terms of providing "a pathway into UKDA" – "as a way to upload data and make data available I think people will use it – whether they see that as a first step to get data into the archive I don't know, that's gonna be another thing to see."

Two interviewees would like to have more supporting information about the submitting and review process: "Submitting for review: what does that actually mean?" It has to be made clear how this works, e.g. what rejection means, what ramifications would be the? As for a deposit in UKDA: "this is slightly different, because now you are going to the realm of depositing data".

Additionally, the submission process should be made a lot simpler and more intuitive from a researcher's point of view, including practical hints like "copy and paste this paragraph from this section of that document (ESRC form)".

Along those lines, the review output tab for one user is very confusing, as he is not familiar with this process of submitting data/publications etc.: "Others might be completely familiar with this process, I am not". Also clicking on 'Approved' should give you a definition on what approved means: "Everyone going through this process for the first time might find this kind of confusing." Furthermore it was seen as quite important to get information/an email on what is happening in the review process and after acceptance/rejection (like "we have now archived your files, here is the reference code of you ever loose them" etc.).

Embargo

All users see the 'Embargo' function as definitely useful, but in the relatively brief time of testing nobody had really used it.

3.2.10 Error Messages

These below are the only error messages (four overall, two documented in the Appendices D & E) encountered by users or the evaluator during the whole evaluation, as far as reported in the interview sessions. Those errors might be trivial or circumstantial in the end, but are nevertheless included in this report to provide as much information as possible to improve the system.

a) Appendix D: Error message received when trying to register a test project: After this error message the project was saved without any metadata, all metadata entered previously had vanished. After entering the data again, the issue was solved.
b) Appendix E: Received in the process of "creating an account". The user later tried to upload the screenshot as a test-file, which would not work and evoked another error message, not fully documented ("I think error 5000, but I am not exactly sure what I was trying to do then"). Then same user later got another error message after not using the system for 45 minutes, having to login again while the system still showed the user as logged in

3.2.11 Useful system for collaboration and questions of uptake

From the viewpoint of using StORe as a collaborative system the expert users made the following points, which nearly all of them combined with the question of uptake by users. It has to be noted, that they did not actually use the system for collaboration or a real project over a longer period of time. This matter would have to be evaluated in another study at a later stage with the system being used for real projects by real users, which can be identified.

- In terms of collaboration the system is useful "for knowing what researchers are doing and trying to get from them the data they are producing. I am not quite sure how to sell this system to researchers in terms of benefits they would get out of it – is this really helping them or is this giving them a few more headaches in the research process (learn new interface, add all metadata, upload all outputs)?"
- For real uptake and collaboration "it would have to be made a lot more simple to use – if ESRC mandates the use of the system, this would be another issue", i.e. it would probably instantly be usable for mandatory use.
- "I would be quite surprised if people with ESRC projects would use this as their central point to share bits. (..) Email is still more likely to be used and for projects with different collaborators it might be useful instead to set up a webpage or [more trivial] system for collaboration. But I see the point of it in terms of preservation and providing a central point of reference for different institutions to store stuff."
- "It also will be nice to encourage people to deposit data. Right now it is difficult to prepare the datasets (formats etc.) to be stored e.g. in UKDA, but if people can do it themselves in a proper way (..), this might encourage people for more data sharing."
- "It will be an interesting question if it will be used for collaboration in a project rather than as an archive at the end of projects."
- One remark on collaboration aspects: "Right now the list of users ('Manage users') does not scale when it gets larger, other forms of representations are needed."

3.2.12 Benefits: "Could you envision using it?"

All five users stated they could envision using the StORe system for themselves or for their supported users and research groups, when some of the issues they encountered would be addressed and improved.

- "With a little more work it could be turned into a useful tool for researchers, and also it's a tool that would help to actually collect some of the data that researchers are producing and that currently goes nowhere."
- "I can see how it can be used (..), I can see how you could manage a collaborative project with it, but it has limitations. (..) A lot of social networking functionalities could maybe added; most of the people out there are not familiar with this kind of system, so it should be easier to use and to be used to greater effect."
- "Possible, if I was looking on information on a particular subject. I am not sure on getting substantial datasets up there, as a lot of my users more likely have small datasets/samples (200 person survey). It could be useful for uploading second or tertiary datasets, subsets on special topics; maybe more for qualitative data."
- "Yes, I could. I think my heart would sink in figuring out how to use it. (..) Main benefit: Depositing one's research outputs."
- "I like the idea of UKDA-StORe, I think it's a good thing to have for the community and it's something I would very much like to see exist"; "and then it needs a lightweight storage process, for stuff you doesn't want to distribute, but ESRC doesn't want to see lost. I probably won't use it myself at the moment, but [it would be good to] be able to say to academics 'don't bother with that, just give it to StORe'. But it would need more work to make it easier usable for academics."

Another point addressed by most of the users was mandatory use sponsored by ESRC. One mentioned the general problem that people would not use it if it was not mandatory from his experience in supporting research groups: "I could do it [using it voluntarily], but they wouldn't". Another interviewee believes, that when it becomes mandatory, a system like UKDA-StORe "seems to be good".

4 Barriers, Facilitators, Robustness & Sustainability

Comparing the StORe pilot in 2007 with the current UKDA-StORe repository portal, the successful development becomes evident immediately. To repeat the quote from chapter 3.2.1: "Having seen it move on from earlier versions it's coming on well and it's coming on a lot – and it's a huge amount of very good work to get this far." The focus has changed slightly, from a generic pilot with the main task to basically link publications to researcher's data to a more complex portal which supports self-curation and sharing of data in a project space with an up-to-date authentification model.

The findings of this evaluation are illustrated in detail in the previous chapter. This section in the following will give a more focused summary under the four headlines main barriers and facilitators, robustness and sustainability. To quote from the phase one summative evaluation report: "Robustness and sustainability are two important criteria to assess the use of a system in terms of functionality, configuration and user's benefit. It comes down to the question, if users would use the system in the wild, for their everyday work. This means on the other hand, to find out the users' reasons of not wanting to use it." It should be added that barriers and facilitators are two concrete categories to depict where users see those benefits or are hampered by – sometimes subjective – socio-technical flaws in a system.

4.1 Main Barriers

This section lists only the main barriers in the evaluation identified by all or at least the majority of users, which seem to have a substantial impact on usability and in the end uptake of use of UKDA-StORe. Therefore these are the issues recommended to address as next steps.

- Navigation within the system: The three to four levels of menu structure, i.e. the different rows of tabs in combination with higher and lower navigation elements – which are realised as Java scripts and page reloads and therefore react differently to the users' input – make the system intransparent and navigation difficult and prevent a smoother and more intuitive experience.
- Displaying information 1: The navigational issue in the previous point is slightly aggravated by the display of vertical link-buttons as shortcuts on the left-hand side of some pages. Perceived as non-working usability and bad design this confused users substantially.
- Metadata 1: The two-part metadata entry page with required fields on both pages in combination with the 'missing data error message', which was not displayed in a proper recognisable way, should be re-designed for ease of use.
- Displaying information 2: There is inconsistency in the display of the green access tick symbol, which in reproducible circumstances becomes the red no access cross when the resource is clicked on.
- Metadata 2: Better 'Help' and supporting functionality in filling out the metadata fields.
- Search and browse: Issues with sorting in the description column and with incorrect/no results for some searches have to be solved.
- Help & Terms and Conditions: Should be checked for consistency, clear content and typos – for the Help feature a more dynamic display of information and the addition of other media would be a bonus.

4.2 Main Facilitator

The main facilitator of UKDA-StORe simply is the good idea of having a system with all its already sufficiently described capabilities, developed for over two years in a interdisciplinary project with a lot of valuable input. Chapter 3.2.12 Benefits: "Could you envision using it?" describes that all interviewees can envision using the system with some improvements in effect in the near future.

4.3 Robustness

Only three bugs (reproducible: one with the access/no access symbols, one with the search and one with the description sort functionality) have been found during this evaluation and only four reported error messages came up, none of them reproducable. The UKDA-StORe system continues along the reputation the pilot achieved in the phase one evaluation. It usually reacts as expected and is stable. The mix-up with Java scripts and page reloads seems to be a tiny dent in the robustness armor.

4.4 Sustainability

What is necessary to make a system sustainable, to foster uptake and to establish a community of users? Part of the following points are rich direct quotes from the expert user interviewees:

- Help and explanation texts: These are fundamental features, which have to be improved continuously, especially for novice users in the relatively complex context of StORe.
- The federated Shibboleth login has been smoothly implemented in the extension phase and is a plus – and at the same time more or less expected from a UKDA application or portal.
- Home page improvement (the first page after login): "Anything that makes it a little more dynamic, any information that is represented could be useful for researchers and will be welcomed".
- "Too much metadata (..) you need to have some project files first" to get the whole thing started":
  "UKDA-StORe has to decide in the end: Is it about getting a lot of datasets in and a lot people to use it or is it about getting fewer datasets and users, but with more (precise) metadata attached?" – "I can see why they want that information, but if UKDA-StORe is for academics to submit stuff so that there are copies and the system is used, this is the wrong approach". "It is a very heavy duty submission process and the interface is a little eclectic." At the same time "it is very much build around this as a set of silos and not how a researcher would say: 'here is a load of stuff, have fun; please keep a copy, don't delete it thank you'."
- "Make the interface a lot simpler", with "as little scrolling as possible" and "make the submission process two screens", like "create a project, upload some files"; add "possibly a third screen that says 'check this information', but make it that simple; at which point you can do all the other stuff later – and: most projects have an abstract you can copy and paste from ESRC".
- Explain to the user why it is beneficial for him to use the system: "What's in it for researchers, that needs to be very, very clear."
- Mash-up and openness vs. generic portal and support: "Generally there seem to be a lot of platforms popping up now for this purposes and in the end there needs to be some cross-referencing between all this systems."
- "The system should be more intuitive", with "a kind of Web 2.0 functionality" and dynamic, also being more visual.

Appendix

Appendix A – Email Outline, Setting the Scene

(..)

Right now the portal is running for a more or less selected group of users, mostly concerned with ESRC projects. But it can be fully explored for this evaluation and is accessible under http://oai.esds.ac.uk:8080/store/ .

With the 'Start using!' / 'All projects' links at the left/right bottom of the first page StORe can be accessed without a login; registering for a login (there are three different ways to do this, explained on the pages, if you want to try, let me know if you have difficulties with that) for full functionality is of course the more interesting thing.

For the interview I would be interested in questions of usability and general usefulness of the system along the lines of e.g.

- general functionality/usability in public browsing the system
- the same with login and full access
- registering/login process
- searching
- creating a project (ESRC or 'Create Other Project') and providing metadata
- help pages/explanation texts
- things nice to have

among other things.

(..)

Appendix B – Interview Guideline

- Start: Greeting; thanks for participation; ask for consent to record;

- Could you say a few words about your background and your previous experiences with repositories?
- Did you use StORe before?
- You spent some time exploring/using/testing the StORe repository.
  What do you think?
- Did you browse/explore StORe without being logged in?
- What did you do?
- What functionalities did you use? (inquire on details, e.g. browse/search features)
- Did you encounter problems?
- What was good/useful?
- Did you log in and how do you assess the login procedure (is the description sufficient)?
- How did you explore the system being logged in?
- Did you create a project?
- Did you upload a file?
- Have the functionalities been clear to you? (inquire on details)
- What do you think of: metadata (categories); finding things; navigation (menus, layers, commands); representation of content (folders, descriptions); help feature (general help/specific help texts)
- Did you submit a file and was the process clear cut?
- In general, what worked well, what was particularly useful? (facilitators)
- What could be improved? (barriers)
- Do you se the use of the system for collaboration?
- Could you envision using the system?

- Finish: Could you point me to other appropriate test users who might be interested in participating in this evaluation? Thanks for participation;

Appendix C – Table of Interviewees

Interviewee	Date of Interview	Interview Length	Form of Interview	Occupation	Tested StORe pilot in 2007	Used UKDA-StORe before
User 1	22/08/2008	38 minutes	semi-structured via telephone, including live testing during interview session	Research Coordinator for Digital Repositories	No	No
User 2	04/09/2008	52 minutes	semi-structured via telephone, including live testing during interview session	Data Manager, support for Economics (& other Social Science) Research	No	No
User 3	05/09/2008	44 minutes	semi-structured via telephone, including live testing during interview session	Data Librarian; also DISC-UK DataShare Project	YES (in the phase one evaluation)	No
User 4	01/10/2008	29 minutes	semi-structured, face-to-face	Data Interface Developer; also tech. support for Social Science Research	YES	No
User 5	09/10/2008	61 minutes	semi-structured via telephone, including live testing during interview session	Data Manager Social Sciences; also DISC-UK DataShare Project	No	No

Appendix D – Error Message 1

Error message received when trying to register a test project on UKDA StORe

HTTP Status 500 -

----

type Exception report

message

description The server encountered an internal error () that prevented it from fulfilling this request.

exception

```
javax.servlet.ServletException
	org.apache.struts.action.RequestProcessor.processException(RequestProcessor.java:545)
	org.apache.struts.action.RequestProcessor.processActionPerform(RequestProcessor.java:486)
	org.apache.struts.action.RequestProcessor.process(RequestProcessor.java:274)
	org.apache.struts.action.ActionServlet.process(ActionServlet.java:1482)
	org.apache.struts.action.ActionServlet.doPost(ActionServlet.java:525)
	javax.servlet.http.HttpServlet.service(HttpServlet.java:710)
	javax.servlet.http.HttpServlet.service(HttpServlet.java:803)
	org.acs.elated.commons.UTF8Filter.doFilter(UTF8Filter.java:12)
```

root cause

```
java.lang.NullPointerException
	org.acs.elated.ui.EditCollectionDCAction.execute(EditCollectionDCAction.java:57)
	org.apache.struts.action.RequestProcessor.processActionPerform(RequestProcessor.java:484)
	org.apache.struts.action.RequestProcessor.process(RequestProcessor.java:274)
	org.apache.struts.action.ActionServlet.process(ActionServlet.java:1482)
	org.apache.struts.action.ActionServlet.doPost(ActionServlet.java:525)
	javax.servlet.http.HttpServlet.service(HttpServlet.java:710)
	javax.servlet.http.HttpServlet.service(HttpServlet.java:803)
	org.acs.elated.commons.UTF8Filter.doFilter(UTF8Filter.java:12)
```

note The full stack trace of the root cause is available in the Apache Tomcat/5.5.26 logs.

Appendix E – Error Message 2

Error message received in the process of “creating an account” on UKDA StORe