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DELIVERABLE

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D5.3 Learning Resources report

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1 INTRODUCTION

This document reports on the work done in Task 5.5 'Learning resources' that is a part of work package 5 'Dissemination, communication and sustainability' of the CIVIC EPISTEMOLOGIES project. The work in task 5.5 focussed on the further identification of skill gaps that hamper the cooperation between cultural heritage- and humanities stakeholders and citizen volunteers. The work included the identification and analysis of suitable online learning resources and best practice examples that can provide cultural heritage professionals and humanities researchers' inside information on challenges encountered by other citizen engagement projects and their lessons learned.

This deliverable provides an overview of relevant online accessible learning resources and best practice examples enabling cultural heritage professionals and humanities researchers to get insight in the organisational and legal aspects involved in the planning of a citizen science project. Specific attention is paid to learning resources that cover the main challenges and barriers identified as part of the research done for the Strategic Research Agenda (SRA) and task 5.5, being: the problem of data quality, IPR, lack of (access to) IT skills, and reaching out to the community. Chapter 2 focusses on learning resources that can help project teams with the design and planning of their projects. The learning resources are structured according to a number of main themes which are more or coherent to the identified challenges: 'Project design', 'Community engagement', 'Data collection procedures', 'Tools and technology', and 'Sustainability planning'. Each section provides an introduction to the challenges and explains the key concepts and best practices to consider, finalising with a list of online accessible resources. The planning guide is not meant to provide a comprehensive overview of citizen science project planning, but should be seen as an introduction to the main aspects to consider and help researchers and cultural heritage professionals find their way to relevant material. Learning resources on intellectual property right are covered separately in chapter 3 'IPR Guide' because of the specific attention IPR deserves when working together with citizens in research. The IPR Guide focusses on data policy for online engagement with citizen volunteers who are actively contributing data and ideas. The chapter is divided into the main components 'User agreements', 'Terms of Use', 'Legal policies and ethical guidelines', and 'Privacy policy'. Additionally, a list of references to best practice examples and further reading material on data policies in relation to citizen science is provided in section 3.3 'IPR Learning Resources'.

There is a close relationship with the Roadmap for Citizen Science and the SRA produced in the framework of the Roadmap.[1] The SRA takes a closer look at the researcher's perspective on the opportunities and challenges of Citizen Science. The SRA identified a number of challenges preventing a wider engagement and collaboration with citizens in scientific research projects, such as data quality concerns, data ownership and the lack of (access to) knowledge on how to

[1] More information on and access to the Roadmap: http://www.civic-epistemologies.eu/roadmap. The Strategic Research Agenda is a part of the final version of the Roadmap.

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deal with data legislation, as well as the often limited access to technical skills in the cultural heritage and humanities domain. Besides the Roadmap, the two case studies 'Hidden Cultural Heritage – Inclusion, Access and Citizenship' and 'Local Cultural Heritage – Inclusion, Access and Economic Development'[2] and the 'Ethnographic Pilot'[3] on Irish place names and place-based heritage organised in the framework of the CIVIC EPISTEMOLOGIES project provide further insight on how community groups of citizens engage with cultural heritage and digital technologies and the organisational and planning aspects involved.[4]

[2] D4.2 Case Studies Report: http://www.civic-epistemologies.eu/wp-content/uploads/2014/07/CIVIC-EPISTEMOLOGIES_D4.2_Case-Studies-Report_v1.0.pdf

[3] D4.1 Ethnographic Pilot report: http://www.civic-epistemologies.eu/wp-content/uploads/2014/07/CIVIC-EPISTEMOLOGIES_D4.1_Ethnograhic-Pilot-Report_v1.0.pdf

[4]All public deliverables can be accessed through the CIVIC EPISTEMOLOGIES website: http://www.civic-epistemologies.eu/project/

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2 LEARNING RESOURCES

2.1 INTRODUCTION: LEARNING RESOURCES FOR OVERCOMING CHALLENGES IN THE PLANNING AND ORGANISATION OF CITIZEN SCIENCE PROJECTS

Part of the research done in the framework of the Strategic Research Agenda[5] of the CIVIC EPISTEMOLOGIES project already highlighted a number of challenges and perceived barriers towards the uptake of citizen science by scholars and cultural heritage institutions. One of the main concerns expressed by researchers and cultural heritage professionals was related to the quality of the data contributed by volunteers. Doubts concerning data quality by professionals manifest in several ways: a personal concern about the capacities of citizen volunteers in being able to provide the same level of quality as professionals and concerns about possible reactions they might receive from their peers reviewing their work about the usage of data gathered with the help of citizens[6]. Another major concern was directed towards the problems of ownership of the data and IPR. While there is a growing awareness towards the importance of IPR, most cultural heritage professionals have little experience with this topic and few institutions have access to legal advice. The third challenge identified in the Strategic Research Agenda was the lack of access to technology skills. Cultural heritage professionals and humanities researchers have limited IT skills of their own and in-house IT departments are busy with the operational level of providing hardware and software for fulfilling the organisations basic mission, and have little room for the development of innovative and user friendly applications that can facilitate virtual science. While these as well as other issues such as difficulties to reach and engage with the community definitely provide barriers in the organisation of citizen science projects, they can be tackled by careful project and data management planning. Any research project, including citizen science, benefits from defining a clear strategy towards reaching its goals by defining projects objectives, stakeholders and targeted volunteer community, communication plan, resources needed for project- and data management planning, sustainability etc. Since most researchers are used to working in smaller teams or on an individual basis, there is little experience with managing larger projects involving a wide variety of participants. This is especially the case in the digital sphere where contact is indirect, making it more difficult to organise the research process. The same can be said from cultural heritage institutions where the application of project management practice isn't widespread. However, especially in the case of citizen science projects, preparatory planning work is the key to success in reaching and engaging target communities, collecting qualitative datasets and achieving long-lasting benefits.

[5] The 'Strategic Research Agenda' is a part of 'The Roadmap for Citizen Researchers in the Age of Digital Cultural Heritage'. See: http://www.civic-epistemologies.eu/roadmap

[6] Riesch H. & Potter C. (2014).

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This chapter therefore provides an introduction to important components to be covered in citizen science project planning. It includes a reference list of learning resources which are organised in subsections, being: project design, community engagement, data collection procedures, tools and technologies and sustainability planning. Data policy and IPR are covered in a separate chapter (cf. IPR Guide). Where possible links to online resources related to the cultural heritage and humanities domain were provided. However, since only a limited number of useful guidebooks and reports are specifically related to the cultural heritage and humanities research domain, reference to relevant material related to other domains such as biodiversity were included as well. The references to reading material in this chapter are not meant to provide an exhaustive overview of all citizen science related publications, but are a selection of learning resources that have a specific focus on the organisational factors that are part of a citizen science project. More relevant reading material can be found in the Bibliography at the end of this document and on the Web.

The CIVIC EPISTEMOLOGIES project delivered two case studies and a pilot on citizen science which provide actual examples of the different steps to be taken when planning and organising citizen science projects:

- **The Pilot study on Irish place names and place-based heritage**:

  The pilot focussed on intergenerational heritage recording with students, assisted by professional experts, interviewing senior citizens on local place-based history. The pilot resulted in a report on the outcomes of the pilot providing useful information on how to plan and prepare a citizen science project, including the identification of and engagement with stakeholders, ethical concerns, selection of tools etc. The pilot also produces an intergenerational digital toolkit and website that provides access to the set of digital applications, services and tools selected for use within this project, and recommended for use for future expansion of the recording heritage with teenagers and seniors.

  Learning resources: Digital toolkit and website[7] ; Ethnographic Pilot Report[8]

- **Case study 'Hidden' cultural heritage – Inclusion, access and citizenship**

  This case study examined how community groups of citizens engage with cultural heritage and the extent to which they participated in the generation and reuse of cultural heritage using digital technologies. The focus was on discovering the extent to which what might be described as 'hidden' cultural heritage and how it could be accessed and shared through digital methods. The report describes the organizations that participated in the Case Study and outline their role within the project, the tools used by the community and how they used those tools to participate in the creation or reuse of digital cultural heritage, and the institutions and services the community used to access the creation of digital cultural heritage.

[7] Digital toolkit and website: http://www.civic-epistemologies.eu/pilot-study

[8] Ethnographic Pilot Report: http://www.civic-epistemologies.eu/wp-content/uploads/2014/07/CIVIC-EPISTEMOLOGIES_D4.1_Ethnograhic-Pilot-Report_v1.0.pdf

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Learning resources: Case studies report[9]

- **Case study 'Local cultural heritage inclusion, access and economic development**

This case study explores the value of Citizen Science in the contribution it can make to generating new perspectives and understandings of the input of specifically local cultural heritage to local economic regeneration and growth. This case study brought together the groups involved in this project to explore the 'fit' of the technologies to local circumstance, and the value of digital technologies – or the limitations particular technologies present - to enhancing the engagement of stakeholders.

Learning resources: Case studies report

2.2 PLANNING A CITIZEN SCIENCE PROJECT

Planning a citizen science project to support digital cultural heritage research is not much different from any other project. It requires clear objectives, careful planning, involving the right people and thinking ahead (including risk assessment and sustainability planning). Of course there are a number of extra challenges when engaging citizens in a project, the main one probably being the involvement of people with possibly no or little experience with research. Citizen science participants need to be carefully guided in all the project steps: informing them in the project's objectives, helping them acquire the necessary skills for collecting, transcribing or interpreting data, training them in the usage of new digital tools for submitting data etc. It takes substantial effort and resources from the project team and the organization to manage a citizen science project, so before you start with one, there are a number of questions you should ask and preparatory steps to be taken. Only when you have your entire plan in writing, including a clear set of objectives, a recruitment and communication plan, data collection and quality control procedures, a set of user-friendly tools to facilitate your work and that of your volunteers, as well as a sustainability plan and evaluation procedure, you're ready to go. This section is meant to provide an overview of the different steps in the planning activity. It's not meant to provide a comprehensive overview of project planning, but rather as a reflective guide to help you decide on your course of action when thinking of organizing a digitally enabled citizen science project. When available, references to relevant resources and existing training materials are listed for further reading.

2.2.1 Project design

There is often a lack of strategic thinking involved when considering citizen science projects for enabling digital cultural heritage and humanities research. The increasing popularity of Citizen Science projects have made many cultural heritage institutions think of it as the Holy Grail to deal with the many challenges they are facing. With the waning interest in the physical collections managed by cultural heritage institutions, citizen science is seen as a way to engage with a new

[9] Case Studies report: http://www.civic-epistemologies.eu/wp-content/uploads/2014/07/CIVIC-EPISTEMOLOGIES_D4.2_Case-Studies-Report_v1.0.pdf

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digital audience in the hope they might be persuaded to move to the physical sphere as well. Another popular idea is that the effort of citizens can help them deal with the backlog in the digitisation of the collections. In short, citizen science projects are seen as a tool to accomplish tasks which might otherwise not be feasible such as increasing the resources for dealing with large datasets and thus reducing the costs of data description, collection and interpretation. But while it's important to think of the benefits a citizen science project could bring for the organisation, it's also important to address the needs and interest of potential volunteers. The RunCoCo project advises to aim for a two-way engagement, ensuring that contribution benefits the participants as well as the organisation[10]. So before starting a citizen science project, think of the questions:

- What are you trying to achieve with the project? What are the objectives?
- Is a citizen science project the best way to achieve these goals?
- How will the organization, you as a researcher and your stakeholders (e.g. funder, citizen volunteer) benefit from the project?

When you have ascertained that a citizen science project is what is needed to achieve your goals, the next step should be to perform a desk research on existing projects to see if there is something similar existing to what you have in mind. With the ever-growing number of citizen science projects on the web, chances are that you will find something fairly similar to what you are planning to do. Existing projects can help you in several ways. First there is the option of contacting the project managers to see if a collaboration between your organization and the existing citizen science project can be set-up. This can happen on several levels such as the reuse of existing tools, access to the community, or the sharing of knowledge and information. Some citizen science portals such as Zooniverse offer documentation on how to build a project using their environment[11]. And RunCoCo offers advice, training and support for organisations looking to use crowdsourcing for the advancement of their research[12]. Of course it's often easier to reuse documentation and information instead of existing tools since these often need special adaptations to meet your own project requirements. Also access to an online community might not be relevant for your project if one of your objectives is to attract local audiences because you intend a combination of a physical and digital component, target a specific audience such as a school group, or when your research is language group specific (e.g. gathering data on local toponyms). Even if you can't use everything, it's still interesting to explore how other projects with similar objectives are handling community building, data quality control, data policies, and training and support. This can help you save a lot of preparatory work and also help you anticipate on problems they've encountered.

[10] RunCoCo project, University of Oxford (2011).

[11] See Zooniverse, How to Build a Project: https://www.zooniverse.org/lab-how-to

[12] See RunCoCo, How to Run a Community Collection online: http://projects.oucs.ox.ac.uk/runcoco/about/index.html

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Once you have ascertained yourself that a citizen science project is the right way forward to achieve your goals, a project charter should be put in writing. This document should outline the scope of the project, its main objectives, needed resources, and define the roles and responsibilities of each stakeholder. This document serves as the baseline of the project and should:

- Clearly specify the reason for undertaking the project
- Define the main objectives of the project with a focused goal and a step by step approach. This will help you target your efforts and get better results.
- Identify main stakeholder. Think of all the roles and responsibilities needed to bring the project to a good end: Who will take care of project management, data management, participant engagement and support (e.g. training, answering questions), project communication (newsletter, forum, blog…), technical support, and project evaluation?
- Provide an overview of the needed resources for each step in the project: budget breakdown of personnel resources, infrastructure resources, sustainability costs…
- Identify possible risks and corrective actions
- Target project benefits and define the evaluation procedure to measure success

A great number of project charter templates as well as project management best practice documentation can be found on the web. While some initial investment of time is required to write a project charter and project plan, it will benefit the project in several ways at a later stage since it reduces the chance of a project failing, defines expected results and who is responsible for them, ensures a minimum level of quality, and keeps costs, timeframes and resources in line with the budget. Table 1 provides an overview of relevant online documentation related to project design and planning:

Relevant resources	**Access**
The Project Charter Toolkit **Organisation/Author:** Casual Online Project Management Tool **Description**: A website providing information, templates, samples and best practices for creating a good project charter.	**Website**: http://project-charter-template.casual.pm/
Project Charter Template **Organisation/Author:** © Eric Dayal **Description**: Detailed project charter template that can be used for projects of all different types.	**Website:** http://www.hitdocs.com/project-charter-template-docx/ **Document**: http://www.hitdocs.com/project-charter-template-docx/?isDownloadingFile=yes&file

	ToDownload=Project-Charter-Template.docx
The two-and-a-bit page guide to running a Zooniverse project. **Organisation/Author:** Chris Lintott & the Citizen Science Alliance **Description:** Information on steps to be taken when designing a citizen science project. It includes a questionnaire intended to help project managers assist with evaluating the suitability of a citizen science project to reach the objectives in mind.	**Document:** https://static.zooniverse.org/www.citizensciencealliance.org/downloads/zooniverse_guide.pdf
Digitisation, Curation and Two-Way Engagement. Final report **Organisation/Author:** Chrisbatt consulting **Description:** Report on the outcome of a short study commissioned by the JISC to examine the potential of community engagement. Chapter 2 focusses on the planning of policy, strategy, impact and value issues to be observed in community engagement (p. 8-19).	**Document:** http://www.webarchive.org.uk/wayback/archive/20140615013928/http://www.jisc.ac.uk/media/documents/programmes/digitisation/dcatwefinalreport_final.pdf
Guide to citizen science: developing, implementing and evaluating citizen science to study biodiversity and the environment in the UK **Organisation/Author:** UK Environmental Observation Framework **Description**: A step-by-step guide towards organizing citizen science projects. While focusing on citizen science in an environmental research context, this guide gives a good overview of the different planning steps needed in any kind of citizen science project such as 'Is citizen science the best approach', 'Define project aims', 'Identify funding and resources' etc. See sections: Before you start (p. 2-6) and First steps (p. 7-10).	**Document:** http://www.ceh.ac.uk/sites/default/files/Citizen%20Science%20-%20pratical%20guide.pdf
Citizen Science Toolkit **Organisation/Author:** The Cornell Lab of Ornithology **Description**: The Toolkit is a compilation of resources and ideas, currently organized under a step-wise framework for project development. The steps were articulated by staff at the Cornell Laboratory of Ornithology, and refined with help from participants at the Citizen Science Toolkit Conference. Though having a focus on biodiversity, it	**Website:** http://www.birds.cornell.edu/citscitoolkit/toolkit/steps

provides a good overview of all the planning steps to take into account in any type of citizen science project.	

Table 1: Overview of Project design learning resources

2.2.2 Community engagement

Engaging a large community of citizen volunteers in a digital cultural heritage and humanities project is probably one of the most challenging aspects of a citizen science project since you not only have to find your volunteers, you also have to keep them motivated and engaged for the entire duration of the project. It's therefore important to have strategies in place for reaching out to your preferred community. The first question you should ask yourself is 'What kind of community am I looking for to help me achieve my goals'. So when identifying your community, consider the following questions:

- Who are you trying to involve: a geographically based community, citizens with a particular interest…? The community you're trying to reach should fit your goal. For example having many non-locally based participants will make personal communication and local impact more difficult. But on the other hand it will give the project a wider scale and possibly a greater variety and number of datasets to be collected.
- What are you expecting from them? Are they up to the job or do they need specialized expertise or additional training?
- How and why will participants be and stay motivated? Describe both the intrinsic (e.g. improvement of skills, digital copy of the transcribed work, free tickets to the museum) and extrinsic (e.g. fun, contributing to society, meeting new people with the same interests) motivation.

Once you know who your community is, it's a good idea to launch a survey or do a short interview asking them if they are interested in participating in such a project and what would be the prerequisites for doing so. This can help you understand what motivates your target community and help you prepare the recruitment and marketing plan. Your community should be brought on board as early as possible and the close relationship should be maintained throughout the project and after. The Dutch project 'VeleHanden' demonstrated the success of such an approach. The project's goal was the transcription of censuses, statistics and other digitised archival material for improved access for both professional and non-professional (amateur genealogists) researchers. From the start the targeted community, in this case the many visitors of the archives doing family history research, was involved in the project. Volunteers participated in the requirements design and iterative software testing, modeling the tool towards their needs and comfort. The result was an extremely motivated and active network of citizens from the first day the project was launched. Those people participating in the project design phase had already started spreading the word to their network of people with a common interest in these kinds of archival materials[13].

[13] Fleurbaay E., Eveleigh A. (2012). Crowdsourcing: Prone to Error?

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It is one thing to identify and involve a community, it's another thing to keep them motivated, especially in longer running projects. The usage of mainstream media can play an important role in staying tuned with what's living in your community. Discussion forums are a good way to interact with participants. Moreover, it allows participants to interact and provide support to each other. In the 'VeleHanden' project the forum was evaluated to have a positive effect on new participants who were trying to find their way while more experienced members felt valued for their knowledge and the support they could provide. For the project team the assistance of motivated and experienced volunteers can help save a lot of time in answering questions and providing support.

The RunCoCo project 'How to Run a Community Collection Online' from the University of Oxford, formulated similar recommendations in their ABC of public engagement strategy. Here follows a summary of the main recommendations[14]:

- **A**im for two-way engagement: Ensure that the contributions benefit both the community and the institution. Communities should be fostered and brought on board as early as possible, and then maintained throughout the funding life-cycle and after.
- **B**e part of your community, particularly through online presence
    - **Online presence** means more than publishing static web pages. As a project and a member of an online community you need to be discoverable, available, active, open to feedback and willing to share. Use social media applications such as Facebook, Twitter, Flickr, YouTube and iTunes to share knowledge, engage with your audience and exchange ideas.
    - **Use open source software** to build your digital environment. Most projects will have to adapt applications to fit to their needs, but by using open source, you can benefit from what the community has already created and you can contribute your own efforts back to the community.
    - **Encourage reuse**. Sharing your work can help you create a bigger impact by reaching a wider audience (researchers, teachers, family historians …), it allows your community to benefit from the work and the feedback you receive can be used to enrich your project. To encourage reuse a suitable license such as a Creative Commons license, should be included.
    - **Test your model and get feedback**: It's important to invite your community in the early stages of your project (e.g. a pilot with a smaller group of users, if possible from different contexts) to test your project's model, procedures and tools.
    - **Share experiences**: Sharing your experiences with others can help you to solve problems and find solutions together. This can be done using online media such

[14] RunCoCo project, University of Oxford (2011).

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as discussion groups and forums, but can also happen through face-to-face meetings. An online project does not only have to be present online.

- **Contribute to email discussion lists and Twitter**: One of the objectives of the RunCoCo project was to engage with other organisations interested in running a community collection online and offer them support. This was done through setting up a helpdesk as well as through email and telephone. Face-to-face meetings are good when reaching out to more locally based communities, but not sustainable if you want to reach a wider audience. Joining and participating in email discussion lists and existing groups can be a more useful approach to getting your message out to a larger audience. Two-way communication on Twitter was also successful.
- **Remember to blog:** Project blogs are very useful to publish information about the project, create discussions on certain topics and engage with the community. In some cases a blog can even replace a website (e.g. most Zooniverse projects have a blog and a forum only). Other benefits of a blog are that it is easily created without a need for a webserver with web design knowledge.

- **C**hallenge your assumptions: Recognize the value that non-specialists bring and aim for equity of engagement, providing interest and motivation for people who might not normally use technology
  - **Share expertise**: Expertise should not be restricted to universities and centers of expertise. By sharing expertise, public contributions will improve. If for example the public is given access to good practice digitisation guidelines, large collections of good enough quality might be built for a fraction of the cost of professional large scale digitisation projects.
  - **Share knowledge**: It's wrong to think that only cultural heritage professionals and academic researchers hold specialist knowledge. There is a wealth of collective public knowledge and many so-called 'amateurs' have a lot to contribute. The challenge for the community collection project is to tap into this knowledge and make use of it in the best possible way. Moreover, the expertise of the public community should be accepted in the circles of academic researchers and professionals as valuable and trustworthy information. Put trust in your community and let them peer review contributions to improve the quality.
  - **"E-include" for equity**: Online citizen science projects such as community collections can help engage people how might not normally use the Web or computers. In this way such projects facilitate digital inclusion of groups who may be left behind as more and more cultural and social communities move online. Heritage and family history projects can serve as a tool for acquiring digital literacy and transferring intergenerational knowledge and skills.

The RunCoCo project has developed and tested different user interaction models that can be applied in different contexts. Information can be found on the project website: http://projects.oucs.ox.ac.uk/runcoco/

The following list of resources provides insight, tips and tricks in community engagement:

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Relevant resources	Access
RunCoCo - How to Run a Community Collection Online **Organisation/Author:** University of Oxford **Description:** The project RunCoCo - How to Run a Community Collection Online was set up to offer advice, training, and open-source software to those interested in running a community collection online. The outcomes and lessons learned can be synthesised into a simple A,B,C of advice for projects and groups who aim to 'crowd-source' with sustainable success: **A**im for Two-way engagement; **B**e part of your community; **C**hallenge your assumptions. The RunCoCo project team have played a key role in supporting and promoting this new way of working with the public for impact, outreach and engagement at home and abroad. The outputs of the project are available on the RunCoCo website for free. These include guides, workflows, reports, training materials and open source software.	**Website:** http://projects.oucs.ox.ac.uk/runcoco/ **Reports:** RunCoCo project, University of Oxford (2011). Final report: How To Run A Community Collection Online. http://projects.oucs.ox.ac.uk/runcoco/resources/RunCoCo_Report.pdf **Videos**: http://podcasts.ox.ac.uk/series/running-community-collection-online
Jisc Developing Community Collections **Organisation/Author:** Jisc **Description:** This resource includes a series of guidance documents covering five main areas for consideration and 10 lessons learnt, summarising the key findings from the Developing Community Content programmes. These guidelines can help institutions or individuals form the basis for planning a new community collection. The issues explored include models for building community collections, motivation, legal matters, impact and sustainability. The experience of the projects shows how two-way engagement can bring real benefits, not only for the education institutions that initiated the projects but also for the communities who took part in them.	**Website:** http://www.jiscdigitalmedia.ac.uk/infokits/community_content/index.html Engaging participants and motivation factor sections: http://www.jiscdigitalmedia.ac.uk/infokits/community_content/guidance/engaging-participants.html http://www.jiscdigitalmedia.ac.uk/infokits/community_content/guidance/motivating-factors.html
Digitisation, Curation and Two-Way Engagement (Final Report) **Organisation/Author:** chrisbatt consulting (study commissioned by the JISC) **Description**: Final report on the outcome of a short study commissioned by the JISC to examine the potential for digitising and curating collections of cultural or social worth by the general	**Reports:** http://www.webarchive.org.uk/wayback/archive/20140615013928/ http://www.jisc.ac.uk/media/documents/programmes/digitisation/dcatwefinalreport_final.pdf

public. The report focusses on the theoretical and experiential knowledge of what are the policy, strategy, impact and value issues to be observed in community engagement and provides an overview of the nature, processes and achievements of reviewed projects.	
Galaxy Zoo: Exploring the Motivations of Citizen Science Volunteers **Organisation/Author:** M. Jordan Raddick (Johns Hopkins University), Georgia Bracey, Pamela L. Gay (Southern Illinois University Edwardsville), Chris J. Lintott (Oxford University), Phil Murray (Fingerprint Digital Media), Kevin Schawinski (Einstein Fellow, Yale University), Alexander S. Szalay (Johns Hopkins University), Jan Vandenberg (Johns Hopkins University) **Description:** The Galaxy Zoo citizen science website invites anyone with an Internet connection to participate in research by classifying galaxies from the Sloan Digital Sky Survey. As of April 2009, more than 200,000 volunteers had made more than 100 million galaxy classifications. This paper presents the results of a pilot study into the motivations and demographics of Galaxy Zoo volunteers, and defines a technique to determine motivations from free responses that can be used in larger multiple-choice surveys with similar populations. Our categories form the basis for a future survey, with the goal of determining the prevalence of each motivation.	**Website:** http://arxiv.org/abs/0909.2925 **Reports:** http://arxiv.org/pdf/0909.2925v1.pdf http://www.researchgate.net/publication/45872874_Galaxy_Zoo_Exploring_the_Motivations_of_Citizen_Science_Volunteers

Table 2: Overview of Community engagement learning resources

2.2.3 Data collection procedures

Data quality is seen as a key challenge when organizing citizen science projects. Unlike in projects where data is gathered, handled and described by professionals, participants in digital citizen science projects have little experience with these kinds of scientific data collection methodologies or with the material itself. Yet these challenges can be anticipated by establishing good quality control and quality assurance procedures. But there is also a change in the mentality needed towards citizen contributions to science. The concerns towards data quality are often more directed towards the possible reactions they expect to receive from their peers reviewing their work[15]. While this problem might be more difficult to tackle, putting quality control procedures in place will help pave the way to general acceptance. All of this should be part of a data

[15] Riesch & Potter (2014). ; RunCoCo project, University of Oxford (2011).

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management plan, involving everything from data documentation to data archiving procedures. As with any research project, data management should also be an integral part of citizen science projects. Unfortunately cultural heritage organisations, and to some degree humanities researchers, have little experience with it. This is due to the fact that in many European countries a data management plan wasn't required in order to receive project funding. Some countries, such as the UK and the Netherlands, have a long standing practice in data management, but this remains fairly limited to the academic spheres. With the requirement from a number of national and European funders (e.g. H2020) in submitting a data management plan, including the obligation to review and update the plan periodically, awareness is growing slowly.

Every citizen science project should do well to appoint a data manager to take care of the project- and data documentation, write the data management plan and help fellow team members to follow data management best practices. Data management should be planned early on in the project and updated on a regular basis. It should address all steps of the data lifecycle[16]. There are many varieties of data life cycles, but the main steps include: Plan the project, Data collection, Data processing, Data Analysis, Data Archiving, Data access, and Data reuse.

[16] Data life cycle management (DLM) is a policy oriented approach ensuring that (digital) research data are retrievable, accessible and comprehensible in the long term. DLM encompasses the organisation, management, documentation, storage, archiving, curation and sharing of research data, from the very start of a research project until the (public) release for reuse of the data.

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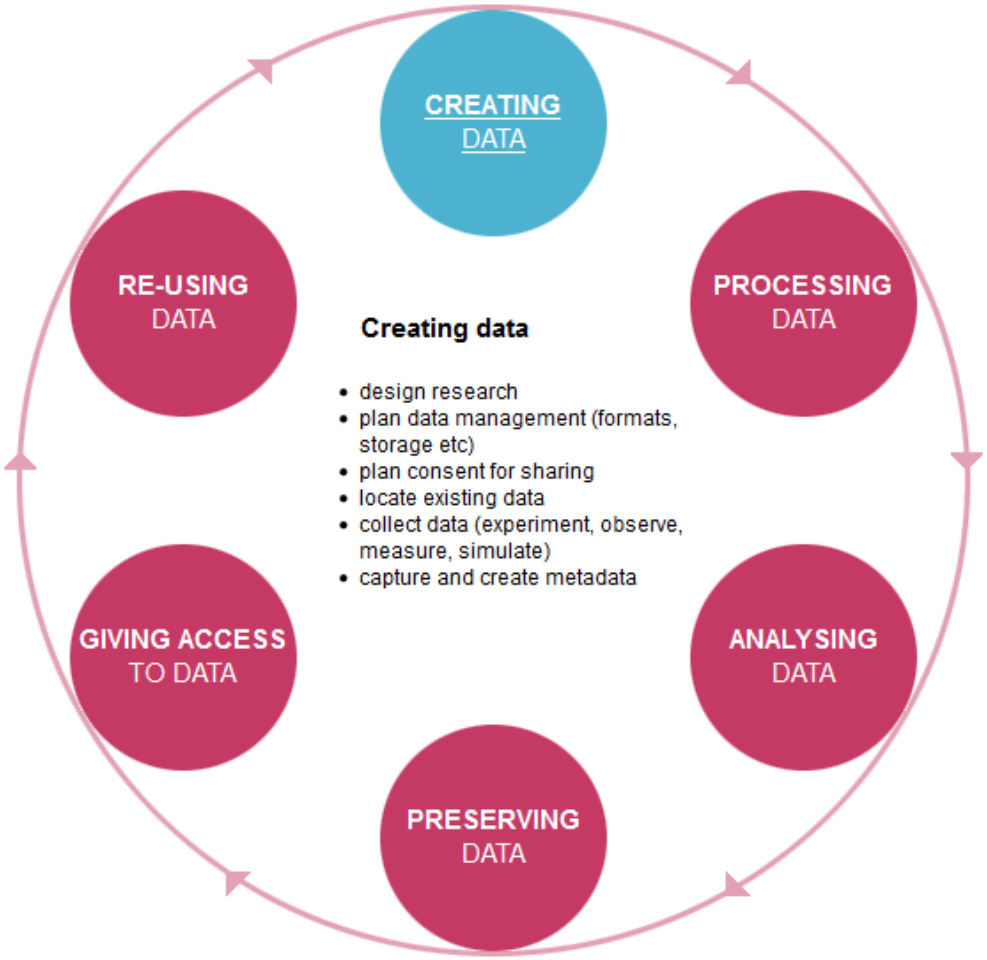

Figure 1: Example of a Data Life-cycle from the UK Data Archive (http://www.data-archive.ac.uk/create-manage/life-cycle)

More information about the data life cycle and data management planning are provided in table 3, but here are some of the general concepts of data management to be considered when collecting research data:

- **File formats**: It's important to choose an open format i.e. a published specification for storing digital data, usually maintained by a standards organization, and which can be used and implemented by anyone. This ensures the data is accessible anytime by anyone.
- **Organisation of files and folders**: use a logical folder structure to easily retrieve files and folders during the project.
- **Metadata**: metadata are data about data. A subset of core data documentation, which provides standardised structured information explaining the purpose, origin, time references, geographic location, creator, access conditions and terms of use of a data collection. It is typically used for resource discovery, providing searchable information that helps users to find existing data, as a bibliographic record for citation, or for online data browsing. Besides the metadata for the discovery of the dataset as a whole, there is also need for good data documentation for the actual content so that other researchers interested in (re)using the dataset can interpret its meaning.

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- **Storage & back-ups**: making back-ups of files is an essential element of data management. Regular back-ups protect against accidental or malicious data loss and can be used to restore originals if there is loss of data. This should be done on network storage and not on external hard drives or personal computers.
- **Versioning**: if data is worked on continually, it is useful to introduce some kind of version management to be able to properly follow the changes. The easiest way of version management is by adding a number at the end of a file after every important change. For software development projects versioning tools such as GitHub are useful.

In any research project attention needs to be paid to project and data documentation, a clearly written protocol for data collection, and the establishment of quality control and validation checks. Especially in citizen science projects the following steps should be taken into account:

- Determine what type of data will be collected and how you will collect it.
- Design data forms, test these together with potential community contributors and make changes where needed.
- Evaluate the data collection procedure based on the input received from test users. This should be a part of a broader, continuous evaluation process. If problems keep appearing, be prepared to rethink the collection process.
- Implement techniques for quality control (e.g. double entry method) and data validation.
- Provide appropriate training material on data collection. If physical training sessions aren't possible, consider creating an instruction video and posting it together with written documentation. Keep in mind that most people don't like reading long texts. Step-by-step tutorials are more effective.
- Be available for questions and support. Creating a FAQ page can be very useful. A blog is a good way for your community to reach the project team, but also each other. In many cases more experienced users can be very helpful in supporting newcomers.

The table below offers a number of relevant guides and reports for best practice data management and collection procedures:

Relevant resources	**Access**
Data Management Guide for Public Participation in Scientific Research **Organisation/Author:** DataOne Public Participation in Scientific Research Working Group. February 2013. **Description:** This guide provides a step-by-step introduction to the data management life cycle. It includes examples from citizen science projects and links to best practices and tools to help project organisers optimize the quality, usability, and accessibility of their project data.	**Document:** https://www.dataone.org/sites/all/documents/DataONE-PPSR-DataManagementGuide.pdf
Citizen science as seen by scientists: Methodological, epistemological and ethical dimensions	**Document:**

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Organisation/Author: Hauke Riesch & Clive Potter **Description:** Paper that presents the results of a series of qualitative interviews with scientists who participated in the 'OPAL' portfolio of citizen science projects that has been running in England since 2007. It highlights a number of issues voiced by the interviewed participants, including the problem of data quality. A number of methods and approaches are provided in the section 'Data quality and how to deal with it' (p. 112 -113).	http://pus.sagepub.com/content/23/1/107 http://pus.sagepub.com/content/23/1/107.full.pdf+html
Digital curation centre online resources **Organisation/Author:** The Digital Curation Centre (DCC) **Description:** The Digital Curation Centre (DCC) is a world-leading centre of expertise in digital information curation with a focus on building capacity, capability and skills for research data management across higher education research community. On their website they provide access to guides, case studies, check lists for data management plans etc.	**Website:** http://www.dcc.ac.uk/ **Online resources:** http://www.dcc.ac.uk/resources On DMP: http://www.dcc.ac.uk/resources/data-management-plans http://www.dcc.ac.uk/sites/default/files/documents/resource/DMP/DMP-checklist-flyer.pdf
UK Data Archive Create & Manage data **Organisation/Author:** UK Data Archive **Description:** The UK Data Archive website provides useful information and references to other documentation related to research data management.	**Website:** http://www.data-archive.ac.uk
The principles of planning, collecting and using citizen science data **Organisation/Author:** UKEOF Environmental Observation Framework, Data Advisory Group **Description:** Advice note on measures to be taken by organisers of citizen science projects in order to guarantee the production of high quality data and its further accessibility and usability.	**Document**: http://www.ukeof.org.uk/documents/DataAdviceNote2.pdf
Guide to citizen science: developing, implementing and evaluating citizen science to study biodiversity and the environment in the UK	**Document**:

Organisation/Author: UK Environmental Observation Framework **Description**: A step-by-step guide towards organizing citizen science projects. While focusing on citizen science in an environmental research context, the guide gives a good overview of the different planning steps needed in any kind of citizen science project, including data collection requirements. See sections: Consider data requirements (p. 19) and data quality assessment (p. 23).	http://www.ceh.ac.uk/sites/default/files/Citizen%20Science%20-%20pratical%20guide.pdf

Table 3: Overview of Data collection and quality control learning resources

2.2.4 Tools and technologies

The digital age and its many technological innovations have the power to bring citizen science to a whole new level. User-friendly online tools provide the possibility to reach more people from a wider geographic context and can help to encourage more active participation. The development of good tools requires a fair amount of resources since you will either need to ask for the support of internal IT support or contract a software development company, acquire the necessary hardware (e.g. servers) or pay for cloud services, and invest your (team's) time in defining the functional and technical requirements, workflows and procedures of the tools to be developed. So before starting to develop a new tool from scratch, it's worth exploring what existing projects with similar goals can be joined and what tools are openly available for reuse. Of course there can be several reasons why it's not possible to join in on an existing project or reuse tools. In case new development effort is needed, consider making the tools as open, flexible and easily adaptable as possible so they can be used in other projects as well. This will help to guarantee sustainability and a return of investment. Successful long living projects such as the 'Zooniverse' and the Dutch project 'VeleHanden' are good examples of this[17]. Having started from a single project, the original environments have by now been adapted and reused by a large number of citizen science projects. In both cases strong IT development teams maintain the environment and provide technical support to new projects. In Zooniverse anyone can build a project using the free project builder tool. After registration you can upload your data and choose the tasks volunteers have to do. A step-by-step guide explains how to build a project using a number of default templates. There is also a direct link to the Zooniverse's policy for building projects page.[18]

[17] More information about the 'Zooniverse' and 'VeleHanden' projects can be found in the 'Strategic Research Agenda' which is a part of D3.2 Roadmap for Citizen Science. See: http://www.civic-epistemologies.eu/roadmap

[18] Galaxy Zoo, Penguin Watch, and Kitteh Zoo, are examples of Zooniverse projects that you could build using the project builder. See: https://www.zooniverse.org/lab-how-to ; https://www.zooniverse.org/projects/vrooje/kitteh-zoo ; https://www.zooniverse.org/lab-policies

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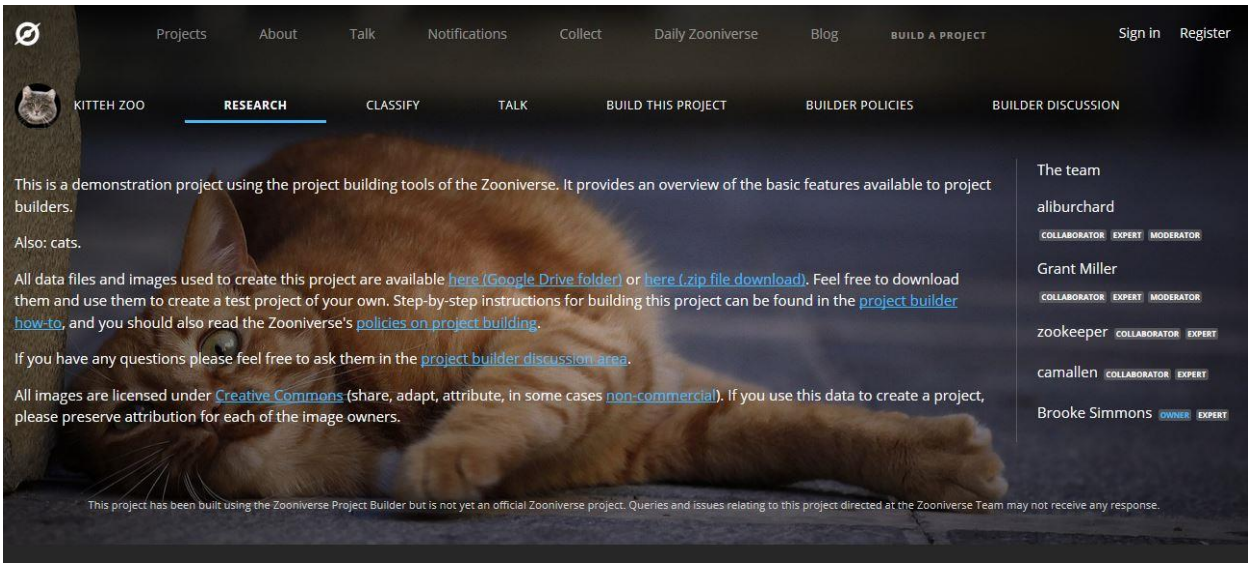

Figure 2: Demonstration project using the building tools of the Zooniverse

When the default project builder isn't able to deal with a specific type of tasks and data, it's possible to contact the Zooniverse team to work together on a custom build project. The VeleHanden project works differently. Here the software is owned and maintained by a private software development. New partners can join by paying a service fee depending on the size, duration and complexity (e.g. in case functionalities need to be developed) of the project.[19]

So when planning to develop new tools for your citizen science project, it's a good idea to reflect on a number of things:

- Is this really new? Chances are big that a similar tool has already been developed by another project (perhaps for a completely different purpose) and shared freely for reuse. Even if it's not entirely able to do what you need it to do for your project, it might be more cost effective to build upon the existing application instead of starting to build something from scratch. And if you share your developments with the community, others will benefit from your efforts as well as helping to maintain and update the entire application[20].
- In-house vs. outsourced: The development of digital tools is a specialised business and most IT teams consist of a number of people in which each has their own specific expertise. Someone specialised in databases might know little to nothing of web programming languages. This means that if you plan to develop the tool in-house or within

[19] Fleurbaay E., Eveleigh A. (2012).

[20] A good example is the Omeka open source software. The software is shared with and adapted by an international community of developers and cultural heritage professionals. The Omeka website provides sufficient documentation on how to design and develop own Omeka plug-ins (http://omeka.org/codex/Documentation). GitHub is used to manage code and share developments. In this way new versions of the software and new functionalities are co-developed by and for the community.

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your own research group or department, you will have to check if these different skills are available and, if not, you have enough resources to hire multiple IT specialists for the time required to develop the tools since you probably won't be able to find all needed IT skills in a single person. Another difficulty is that skilled IT personnel are hard to come by and that most public cultural heritage institutions are restricted in the wage scales defined by their government. In-house development still seems more attractive to many cultural heritage professionals and humanities researchers because of the idea of flexibility in the development process, providing the project team the possibility to adjust the tool's functionalities when new ideas come up. But this is also a main pitfall in many IT projects because the preparatory design phase might not have been thought through completely because asking for changes from a team member is easier then filing a change request at your contracted software company. One final consideration should be kept in mind, and that's the sustainability of the tools. Once a project is finished it might be hard to keep all of the team's members, including the IT professionals, leaving you with an environment that no one can maintain or update. When working together with a service provider, they can provide the hosting of the servers as well as the specialised personnel for the necessary updates and security packages. This also gives you a clear overview of the total cost of ownership for maintaining your hard- and software, something that is still too often ignored when hosting in-house.

- Extending your existing website or online catalogue by adapting a number of existing functionalities and using freely available tools can bring quick wins to your project. E.g. adding online data entry forms and usage of social media tools such as forums and blogs.

The guide to Citizen Science lists a number of additional hints and tips related to technology selection.[21] Though directed to citizen science to study biodiversity, these tips are relevant for citizen science projects related to other domains. In summary the following advice is formulated:

- Be flexible. Can you include different approaches within your project?
- Citizen science should be innovative and imaginative, combining the collation of high quality and useful data while appealing to the volunteer community.
- Select technology appropriate for your target participants. By opting for a particular technology you will be implicitly engaging particular communities, so choose an approach that is both interesting and accessible to your potential participants.
- Mobile phone signal strengths can be variable. This can affect projects that rely on data upload via mobile phone or tablet. If you plan to use this technology, consider allowing mobile devices to store data for upload when a signal is available.
- Consider the risks of the technology failing (e.g. launch-day website crash) and what you can do to address these.

[21] Tweddle, J.C., Robinson, L.D., Pocock, M.J.O. & Roy, H.E (2012).

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- Only be as high-tech as necessary. Cutting-edge projects can capture people's imaginations, but there is a cost to all development, and some of the most successful projects rely on simple face-to-face interactions.

The list below provides an overview of online resources related to the usage of digital tools and technologies in citizen science projects:

Relevant resources	Access
The future of citizen science: emerging technologies and shifting paradigms **Organisation/Author:** Greg Newman, Andrea Wiggins, Alycia Crall, Eric Graham, Sarah Newman, and Kevin Crowston **Description:** The article addresses the influences of sociocultural issues related to the usage of new technologies and the evolution towards networked, open science and the use of online computer/video gaming as important tools to engage non-traditional audiences. The authors offer recommendations to help prepare project managers for the impending challenges of the increased use of technologies in citizen science projects.	**Document**: http://www.esajournals.org/doi/pdf/10.1890/110294
Guide to citizen science: developing, implementing and evaluating citizen science to study biodiversity and the environment in the UK **Organisation/Author:** UK Environmental Observation Framework **Description**: A step-by-step guide towards organizing citizen science projects. While focusing on citizen science in an environmental research context, the guide gives a good overview of the different planning steps needed in any kind of citizen science project including defining technological requirements. See sections: Consider technological requirements (p. 21).	**Document:** http://www.ceh.ac.uk/sites/default/files/Citizen%20Science%20-%20pratical%20guide.pdf
Technology-Mediated Citizen Science Participation: A Motivational Model **Organisation/Author:** Oded Nov, Ofer Arazy, David Anderson **Description:** The article addresses the motivational factors for volunteers in technology mediated citizen science projects.	**Document**: http://faculty.poly.edu/~onov/Nov_Arazy_Anderson_Citizen_Science_ICWSM_2011.pdf

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Technology tools to advance citizen science **Organisation/Author:** Interdisciplinary environmental studies **Description:** This blog provides an overview of tools that can be used in several stages of a citizen science project. It offers links to tools for planning, funding, data collection, data analysis, and data display that can also be useful for cultural heritage and humanities related citizen science projects.	**Blog:** https://iesinternships.wordpress.com/2014/04/17/technology-tools-to-advance-citizen-science/

Table 4: Overview of Tools and Technology related learning resources

2.2.5 Sustainability planning

The sustainability of projects is still too often forgotten or ignored by cultural heritage organisations and humanities researchers. This is problematic since in most externally funded initiatives sustainability is a major challenge. Citizen science projects should therefore timely explore what institutional resources are available and if necessary search for external partners for (collaboratively) maintaining the infrastructure, data storage and community support. In case new tools were developed in the project or redevelopment of existing tools took place, sharing them as open source with a developer community will bring benefit in the long-term. First of all the effort to keep the software up to date in the fast evolving IT sector can be shared with multiple developers. Secondly, tools used by a wider community of users will generally evolve more quickly since new applications will bring new requirements which will result in new developments that can be contributed back to the software as additional code and plug-ins.

Planning of the project sustainability should be tackled early on in the project during the project design phase. This information is to be included in the data management plan and should be updated during later stages when the project reaches maturity.[22] When planning your citizen science project, make sure to estimate the following costs and effort beyond the project's lifetime:

- Data storage is a permanent cost that can weigh heavily on an organisations budget. Make a selection of what has to be archived for later access and reuse. Provide resources for data documentation so that datasets can be easily found and retrieved.
- In case project tools and community engagement should remain active, assess the costs for:

[22] For example, projects funded under H2020 are requested to provide at least tree DMP versions and more if important changes to the project occur. From: Guidelines on Data Management in Horizon 2020. Version 1.0, 11 December 2013.

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- Hardware and software hosting and maintenance, domain names, licences etc. When hosting in-house, consider the total cost of ownership (electricity, IT personnel resources, network connections …)
- Supporting personnel (community manager, data manager, site administrator...)

There are several guideline documents, reports and case studies available concerning sustainability planning for digital initiatives in the higher education and cultural heritage sectors. The Jisc Strategic Content Alliance provides links to several useful documents and video's on their website. References to this and other relevant material are provided here:

Relevant resources	Access
Business Modelling and Sustainability **Organisation/Author:** Jisc Strategic Content Alliance **Description:** The website provides access to publications, case studies, video material on business models and sustainability planning for higher education and cultural heritage projects, including citizen science.	**Website:** http://sca.jiscinvolve.org/wp/allpublications/business-modelling-publications/
Jisc Developing Community Collections **Organisation/Author:** Jisc **Description:** Information about how projects participating in the Jisc Developing Community Content programmes managed sustainability. Seven ideas, from these projects and others, are detailed in this online guide.	**Website:** http://www.jiscdigitalmedia.ac.uk/infokits/community_content/guidance/routes-to-sustainability.html
Sustainability of international cooperation projects in the field of higher education and vocational training. Handbook on sustainability **Organisation/Author:** European commission, Directorate-General, Education and Culture **Description:** The Handbook provides a description of the various features of sustainability to bear in mind when designing or managing a project; a presentation of the key factors of sustainability to take into account in order to anticipate threats or opportunities for safeguarding project activities and/or outcomes; useful recommendations for project leaders to design and manage their Higher Education cooperation project with a view to enhancing its potential sustainability.	**Document:** http://eacea.ec.europa.eu/tempus/doc/sustainhandbook.pdf
Digitisation, Curation and Two-Way Engagement. Final report	**Document:** http://www.webarchive.org.uk/wayback/archive/20140615013928/htt

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Organisation/Author: Chrisbatt consulting **Description:** Report on the outcome of a short study commissioned by the JISC to examine the potential of community engagement. Page 31-34 lists a number of examples how the investigated project's deal with their sustainability.	p://www.jisc.ac.uk/media/documents/programmes/digitisation/dcatwefinalreport_final.pdf

Table 5: Overview of Sustainability planning related learning resources

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3 IPR GUIDE

3.1 INTRODUCTION

In the past years cultural heritage institutions and humanities researchers have become increasingly aware of intellection property rights (IPR) due to the massive increase of online data sharing and initiatives such as Europeana and its related projects working on IPR in relation to cultural heritage.[23] Also in citizen science it's important to tackle the topic of IPR early on in a project since it specifically influences the dissemination and usage of the research produced by the public participants in the projects. Depending on the type of citizen science project you are planning to organise (transcription, data gathering, solving problems, sharing ideas), there can be more or fewer risks involved and other intellectual property considerations to take into account.[24] Citizen science projects should therefore pay special attention towards the creation of a comprehensive data policy that protects the project, the research output and the citizen participants. For citizen science projects this policy should include the following formalised policy documents: user agreements, privacy policy, legal policies, and terms of use.

This IPR Guide provides a general introduction to data policy and these four key components. For more information on IPR related to citizen science, a list of references to best practice examples and further reading material is provided in section 3.3 IPR Learning Resources.

Note: This guide is for informational purposes only and should not be considered as legal advice. If possible an organisation should seek legal counsel if undertaking a large and IPR sensitive citizen science project. Research universities could seek help in their legal departments. Cultural heritage organisations might be able to use the legal services of the umbrella organisation.

3.2 DATA POLICY

Data policies are a collection of guidelines that define the interaction between different user groups and the way data is collected and handled within the project. The rights of the project, its team and the rights of the user and volunteer should be detailed in a number of formalised project documents: user agreements, terms of use, legal policies and privacy policies. These documents should be clearly formulated and made available on your project website either as a single document or as several interconnected pages since they should not be hosted in isolation. Since data policies encompasses all steps of the data life cycle, it's also important to integrate them into the data management plan of the project.

[23] Many Europeana related projects have worked on the topic of IPR and cultural heritage and published reports, for example: Europeana IPR guidelines (http://pro.europeana.eu/structure/europeana-ipr); Europeana Space Copyright tools for cultural heritage (http://www.europeana-space.eu/content-space/copyright-tools-for-cultural-heritage/) ; Europeana Fashion IPR guidelines (http://blog.europeanafashion.eu/download/Europeana%20Fashion%20IPR%20Guidelines.pdf)

[24] Scassa T. & Chung H. (2015).

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3.2.1 User agreements

Every Citizen Science project should draft a user agreement. This agreement is a legally enforceable contract between the project and its participants. This contract outlines the behaviour expected of each party. When a citizen science volunteer accepts the project's user agreement, he or she also accepts the project's terms of use, legal- and privacy policies.[25] The same rules of engagement apply for the project's management and cover both online and offline behaviour. There are two main types of user agreements:

- **Clickwrap agreements**: In this type of agreement the user explicitly has to accept the guidelines formulated in the agreement. This can happen in multiple ways such as a direct visualisation of the entire user agreement on the screen which implicates the user is unable to ignore the agreement text. This method is often used for software installation packages since there is a higher risk involved when installing something on the users own environment. More often website use a simple check box included in, for example, registration forms. In this case the user simply has to toggle check the 'I agree' box. The agreement text itself isn't visualised on the page, but is referenced to with a link.

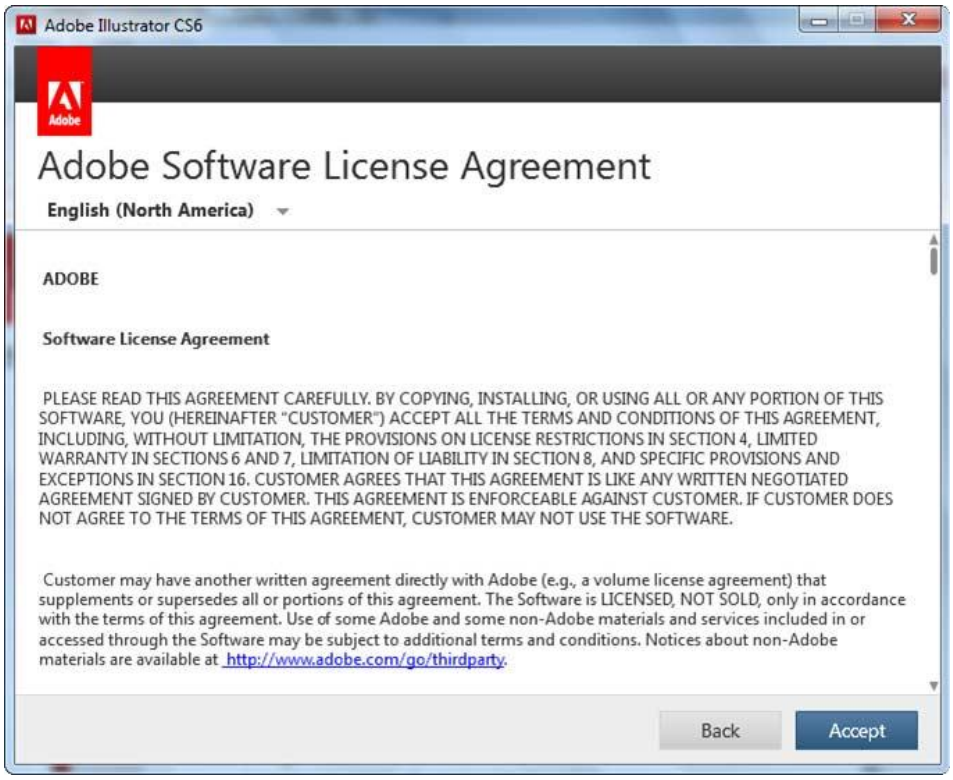

Figure 3: Example of a reading box clickwrap agreement, Adobe software license agreement

[25] Browser A., Wiggins A. & Stevenson R. (2013).

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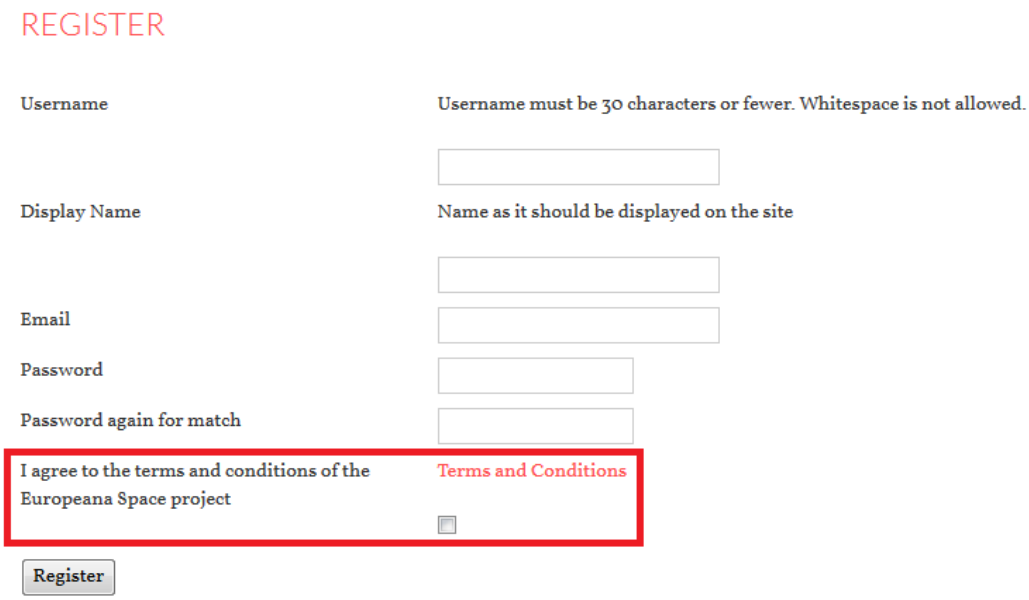

Figure 4: Example of a toggle check clickwrap agreement, Europeana Space Photography pilot storytelling application

- **Browsewrap agreements**: In this type of agreement the user doesn't have to explicitly accept the agreement by checking a box. Instead, the agreement is published on the project's website for everyone to read. A visitor implicitly agrees to the policy conditions by using the website.

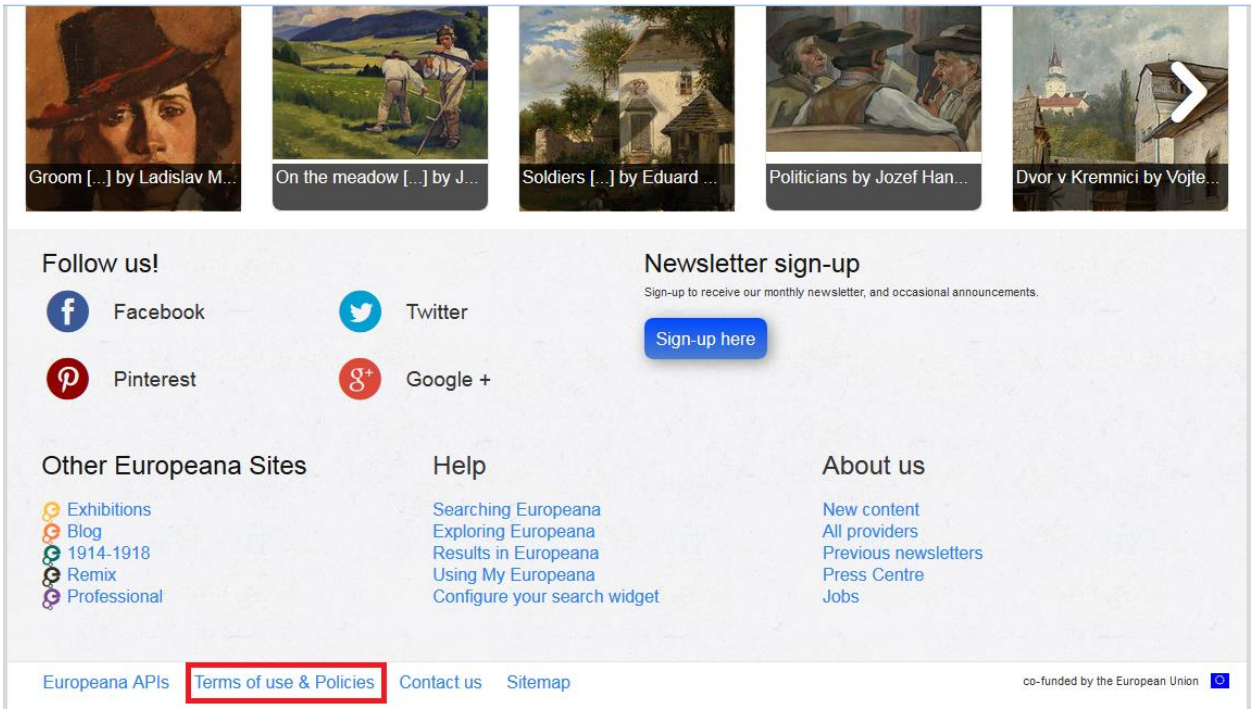

Figure 5: Example of a browsewrap agreement, Europeana portal

The clickwrap agreement implicates that the users have seen and read the agreement. For citizen science projects working with registered users who are involved in a variety of research related actions, a clickwrap agreement with a toggle check box stating the user's consent seems the most appropriate solution. For website visitors undertaking no part in the research, a browsewrap will suffice.

Best practices for User agreements

The user agreement on a project's website should be clearly visible and easily accessible to the user. In case of a clickwrap agreement, the most legally secure option is to have the full agreement visible on a single page since a scroll box or a link to the full terms and conditions can be argued to have escaped notice. In short:

- user agreements should be permanently accessible,
- preferably on a single page and fully visualised,
- with preference to having users explicitly accept (or decline) the agreement, especially in the case of data collection.[26]

3.2.2 Terms of use

The 'Terms of use' are the terms and conditions a user has to agree on in order to use a service, such as a website, a software or usage of a dataset. It usually includes information on data ownership or copyright, rules on access and reuse of data (data licences, citation), and how collected data (cookies, data submissions) are used and protected (security and privacy).

Data ownership in citizen science projects

For citizen science projects collecting data, it's crucial to provide clear information on copyright and what participants can expect concerning authorship and ownership of their contributions. Since copyright provides the creator of an original work the rights on its use and distribution, it's important to make sure you can actually make use of the contributed data. The risks concerning copyright is also influenced by the type of contributions requested from the participants. Asking your participants to classify or transcribe data will be less IPR sensitive than for example asking them to give an interview. This has to do with the level of creativity and expression of an original idea of their contribution, since facts itself are not copyright protected. In the case personal data is collected, such as personally identifiable data and interviews, there are also ethical considerations to be taken into account (see also 3.2.3Legal policy and ethical guidelines).

It is possible for a project to claim a part of or the full copyright of the contributed content from the participant by specifying this in the Terms of use. By accepting the Terms of use, the contributor waives his/her copyright to the data for the benefit of the project and the research. There are several ways of dealing with copyright in citizen science projects. Some projects claim the full ownership or copyright of all the data collected while others give users copyright over their own

[26] Electronic Frontier Foundation: https://www.eff.org/wp/clicks-bind-ways-users-agree-online-terms-service ; Browser A.Wiggins A. & Stevenson R. (2013).

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contribution but keep the copyright to the full dataset such as in the case of the Zooniverse project[27]:

"You retain ownership of any contribution you make to the Zooniverse, and any recorded interaction with the dataset associated with the Zooniverse. You may use, distribute or modify your individual contribution in any way you like. However, you do not possess ownership of the dataset itself. This license does not apply to data about you, covered in the Privacy Policy."

When claiming the copyright of the data being provided, it's important to specify why you are doing so and how the data will be used by the project. For example:

"The major goal for this project is for the analyzed data to be available to the researchers for use, modification and redistribution in order to further scientific research. Therefore, if you contribute to the Zooniverse, you grant the CSA and its collaborators, permission to use your contributions however we like to further this goal, trusting us to do the right thing with your data. However, you give us this permission non-exclusively, meaning that you yourself still own your contribution."

Providing access to data collected with the help of citizen volunteers

The Terms of use should also specify how data contributors can get access to their own data and how access is provided to the entire dataset for usage by 3rd parties. There are several ways of providing access to the community contributed datasets, for example:

- access limited to the individually contributed data
- access provided to the entire dataset through a web interface
- access provided through download of the entire dataset in a machine readable format

When you decide to share your raw data, this should be done with attention to the resources needed for doing this in a qualitative way such as providing proper documentation on the metadata so others can interpret the data and attribution and licence information concerning reuse.

The use and reuse of the data can also be managed in a variety of ways, for example requiring the citation of the project or even the involvement of project team as co-author in any publication coming forth of usage of the dataset. Many projects that allow full usage and reuse of the data have adopted a Creative Commons licence.[28] Explicitly mentioning one of these licences in your Terms of use can be clarifying for people interested in reusing the dataset. It is also possible to adopt different licences for different datasets.[29]

Best practices for Terms of use

[27] See Zooniverse User Agreement and Privacy Policy: https://www.zooniverse.org/privacy

[28] Depending of the contributed license, Creative Commons facilitate the copying, reuse, distribution and, the modification of the original owner's creative work without needing to get permission each time from the rights holder (http://creativecommons.org/).

[29] Browser, A., Wiggins, A., & Stevenson, D. R. (August, 2013).

The DataONE Public Participation in Scientific Research formulated a number of best practices to follow when formulating the Terms of use:

- Determine who holds the copyright of the data submitted by volunteers
- Determine who holds the copyright of the entire dataset
- Post copyright permissions for individual data and the entire dataset the user agreement and on the policy page
- Determine how you want the data to be (re)used
- Post explicit permission for access and reuse, including information about data citation, community attribution and requirements for co-authorship
- Include attribution and licence information in downloaded data files

3.2.3 Legal policy and ethical guidelines

Legal policy comprises the project's legal compliance with national, regional and local law. Legal policies are there to protect the rights of users, volunteers, and the project itself. Examples of these are regulations concerning the collection of data through cookies which is generally a part of your privacy policy (see 3.2.4 Privacy polic), or the liability of the project and its team in case of misuse of the data they provide. Projects that are funded by grants should also follow the legal and ethical guidelines of the funding organisation. Moreover, if a data policy is in place at local organisation level, such as is the case for research universities, projects must adhere to these guidelines as well.

Liability disclaimers

Liability refers to legal responsibilities when a person or group experience direct or indirect damage arising from the use of the website, the content, materials and functions. In case of citizen science projects this could be physical harm happening to a participant in the frame of a project activity. For example a participant collecting photographic material of classified buildings in a city gets injured while taking the photograph. Also in the digital sphere, projects could be in danger of liability charges, for example through damage received by improper usage of information and data posted on the website by other people. Without a proper liability disclaimer projects would be guilty of harm when charged. Projects can explicitly mention in the Terms of use that they are not liable for the negative results that arise from using (or the inability to use) their website, data or offered tools.

The New York public library, where the NYPL LABS engages regularly with citizen volunteers in the collection, transcription and sharing of ideas, has an extensive Terms and conditions including a legal disclaimer waiving responsibility for damage arising from the use of their website, content, material and functions offered to the public[30]:

[30] New York Public Library Website Terms and Conditions. See: http://www.nypl.org/help/about-nypl/legal-notices/website-terms-and-conditions

"1. All materials on the NYPL Websites are provided "as is" without a warranty of any kind, either express or implied, including but not limited to the implied warranties of merchantability, fitness for a particular use, and/or non-infringement. The Library assumes no responsibility for damage to your computer or other property resulting from your use of the NYPL Websites. You understand and agree that any downloading or obtaining of material or data through the NYPL Websites is done at your own risk. In addition, we disclaim any and all responsibility or liability for the accuracy, reliability, and legality of materials found on the NYPL Websites.

IN NO EVENT SHALL NYPL OR ANY OF NYPL'S TRUSTEES, EMPLOYEES OR AFFILIATED ENTITIES BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY OR PUNITIVE DAMAGES ARISING FROM, OR DIRECTLY OR INDIRECTLY RELATED TO, THE USE OF, OR THE INABILITY TO USE, THE NYPL WEBSITES OR THE CONTENT, MATERIALS AND FUNCTIONS RELATED THERETO.

2. Some pages on the NYPL Websites include links to other websites. The Library has not reviewed all of these websites and is not responsible for the content of these websites. The Library provides these links as a convenience only, and a link does not imply endorsement of, sponsorship of, or affiliation with the linked site by the Library.

3. The Library offers access to a broad range of information and materials, including certain materials that may contain offensive language or negative stereotypes. You should view such materials in the historical context in which they were created. All historical media are presented as specific, original artifacts, without further enhancement to their appearance or quality, as a record of the era in which they were produced. Opinions expressed on the NYPL Websites are not necessarily those of the Library or of its Trustees and staff."

In the framework of the 'Europeana 1914-1918 – untold stories & official histories of WW1' community collection project, Europeana has created a 'Terms of user contribution' page addressed to people contributing content and metadata to all the websites operated by the Europeana Foundation. This page includes the following liability disclaimer[31]:

"Europeana assumes no liability for damage or loss as a result of any failure in fulfilment of the provision of the Service, including but not limited to damage or loss arising from or relating to the use of the Website and/or any impossibility of using it, or as a result of any unlawful act or otherwise, unless this exclusion of liability is not allowed under mandatory provisions of law.

Europeana assumes no liability for the substance of the Content and/or Metadata, nor, therefore, for damage or loss to Users or other Third Parties that arises from any unlawful substance of the Content and/or Metadata.

The User indemnifies Europeana against all Third-Party claims on any grounds whatsoever that relate to the compensation of damage, loss, costs or interest, in connection with or arising from

[31] Europeana Terms for User Contributions. See: http://www.europeana.eu/portal/rights/terms-for-user-contributions.html?lang=en

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his/her use of the Service and/or any breach of these Terms for User Contributions and/or any other rights of Third Parties.

This restriction of liability does not, however, intend to exclude Europeana's liability for intent and/or willful recklessness by Europeana ('own actions') itself and/or its executive managers.

The only action the User may take if he/she is of the opinion that he/she has sustained any damage or loss is to cease using the Service and close his/her Account."

Ethics and consent

Depending on the type of citizen science project (e.g. oral history) and the target groups involved (e.g. vulnerable groups or minors), additional care for ethical issues needs is needed. Most research universities have an ethical committee who ethically review research projects and provide online guidelines[32]. Also funding bodies issue additional ethical guidelines to be taken into account. These guidelines as well as national and European laws on data protection and privacy of personal data should be checked before starting to collect personal data and included in the project's privacy policy (see also 3.2.4 Privacy polic).

When collecting personal information such as personal identifiable information and personal stories (interviews), the two main ethical considerations to take into account are consent of the participants and confidentiality. The UK Data Archive summarises the following key principles of research ethics related to the sharing or archiving of confidential data[33]:

- a duty of confidentiality towards informants and participants
- a duty to protect participants from harm, by not disclosing sensitive information
- a duty to treat participants as intelligent beings, able to make their own decisions on how the information they provide can be used, shared and made public (through informed consent)
- a duty to inform participants how information and data obtained will be used, processed, shared, disposed of, prior to obtaining consent
- a duty to wider society to make available resources produced by researchers with public funds (data sharing required by research funders)

Best practices in Legal policy and Ethical guidelines

- Identify relevant legal laws and guidelines related to data collection, privacy of personal data

[32] For example 'The Social and Societal Ethics Committee' of KU Leuven. See: https://www.kuleuven.be/english/research/integrity/smec/index

[33] UK Data Archive resources on consent & ethics. See: http://www.data-archive.ac.uk/create-manage/consent-ethics/legal?index=0

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- Include a general legal disclaimer on your website and citizen science portal on the usage of the websites content, materials and tools
- Explain what data is collected and for what purpose. In case sensitive data is collected, arrange consent forms.
- Specify how this data is handled (confidentiality, data security) and used by the project in coherence to local, national and international law.
- Make sure this information is formulated in understandable terms and clearly visible on your website as part of your Terms of use and privacy policy

3.2.4 Privacy policy

Privacy policies describe how a project gathers and manages personal data from website users (e.g. cookies, web logs…[34]) and volunteers (e.g. personal data gathered through registration). There are many different policy related topics concerning data privacy. Below are some of the main aspects to take into account when drafting your data policy:

Cookies

User data collection through cookies is a standard practice on the web. A cookie is a small piece of data that a website asks your browser to store on the hard drive of your computer or mobile device in order to remember your actions or preferences over time. In this way cookies can help websites improve the quality of a user's visit.[35] Most web browsers automatically accept cookies unless this is stated otherwise in your browser's privacy settings.

The E-Privacy Directive of the European Union requires prior informed consent for storage and access to information stored on a user's hard drive. This means that the user has to be explicitly informed about how the website handles cookies and the user has to accept the use of cookies before the website can start gathering them.[36] However, for some type of cookies such previous consent isn't required. The following exceptions are listed in the EU Internet Handbook[37]:

"Consent is not required if the cookie is:

- *used for the sole purpose of carrying out the transmission of a communication, and*
- *strictly necessary in order for the provider of an information society service explicitly required by the user to provide that service.*

[34] Most websites gather information about a user's service provider, operating system, browser, IP address, pages visited, date and time of use through cookies and log files.

[35] Source 'The EU Internet Handbook': http://ec.europa.eu/ipg/basics/legal/cookies/index_en.htm

[36] The Directive on Privacy and Electronic Communications (E-Privacy Directive), Article 5(3): http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32002L0058:EN:HTML

[37] See: http://ec.europa.eu/ipg/basics/legal/cookies/index_en.htm#section_2

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Cookies clearly exempt from consent according to the EU advisory body on data protection[38] include:

- *user-input cookies (session-id) such as first-party cookies to keep track of the user's input when filling online forms, shopping carts, etc., for the duration of a session or persistent cookies limited to a few hours in some cases*
- *authentication cookies, to identify the user once he has logged in, for the duration of a session*
- *user-centric security cookies, used to detect authentication abuses, for a limited persistent duration*
- *multimedia content player cookies, used to store technical data to play back video or audio content, for the duration of a session*
- *load-balancing cookies, for the duration of session*
- *user-interface customisation cookies such as language or font preferences, for the duration of a session (or slightly longer)*
- *third-party social plug-in content-sharing cookies, for logged-in members of a social network."*

There are generally two common practices in informing a user about a websites cookie policy. The first follows the **clickwrap agreement** method (cf. 3.2.1 User agreements), with a pop-up appearing about cookies and privacy policy when first visiting the website. When the user declines the cookies, functionalities such as log-in will be impaired.

[38] EU advisory body on data protection - WP29: http://ec.europa.eu/justice/data-protection/article-29/documentation/opinion-recommendation/files/2012/wp194_en.pdf

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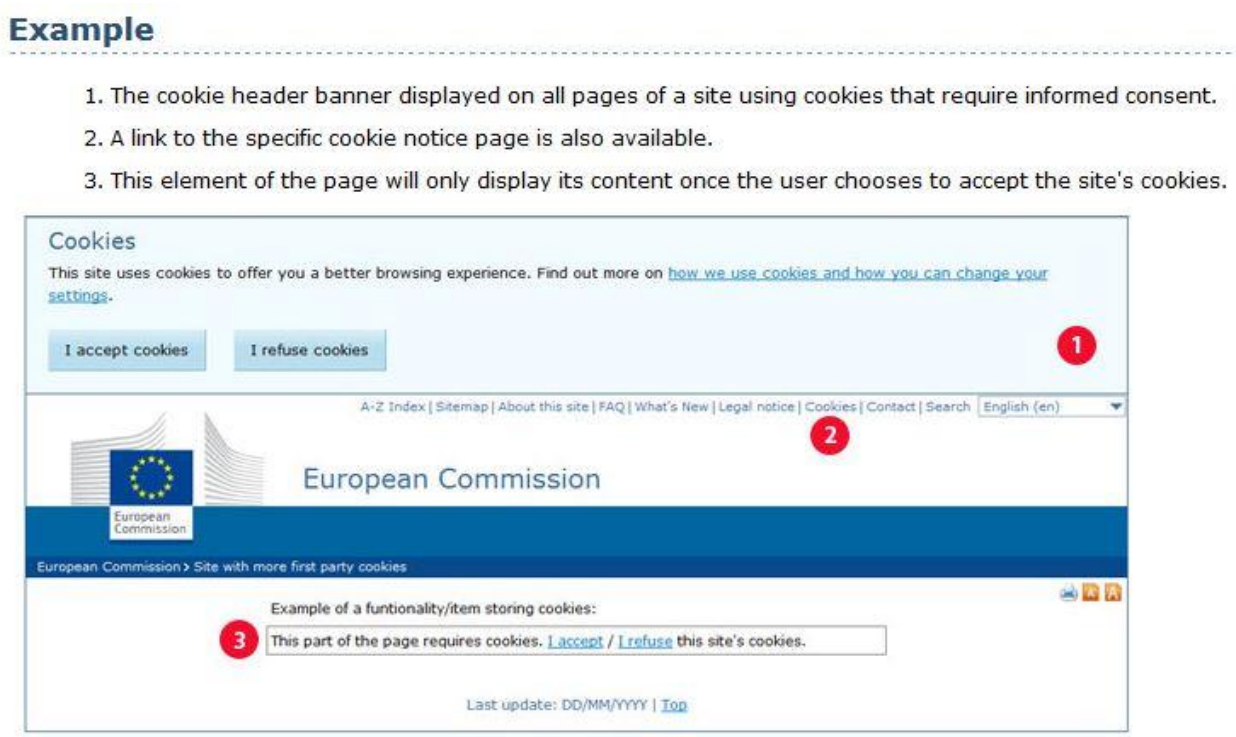

Figure 6: Example of cookie policy of the European Commission[39]

Another option which is often used is a reference to the privacy policy page. This strategy follows the **browsewrap agreement** method (cf. 3.2.1 User agreements). The Zooniverse project *'War Diary. Reports from the Front'* follows this strategy. On the home page a link is provided to the Zooniverse privacy policy page. This page provides specific information about privacy policy and the usage of cookies, how a web browser by default accepts cookies unless stated otherwise in your browsers privacy setting and, according to the browsewrap agreement, explicitly mentions that *"Acceptance of cookies is implied if you continue to access our website without adjusting your browser settings*".[40]

[39] Taken from: http://ec.europa.eu/ipg/basics/legal/cookies/index_en.htm

[40] Taken from: https://www.zooniverse.org/privacy

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Figure 7: Project 'Operation War Diary'. Link to the Zooniverse privacy policy page

Personally identifiable information

Personally identifiable information is information that can be used to identify, contact or locate an individual. It includes information such as a full name, user name, email address, contact information (physical address, telephone number), and demographics. This kind of data is generally collected from citizen science volunteers who register on a portal for participating in a project. Additional data is sometimes collected from volunteers who upload information where a geographic component is of importance. These types of data could include geo-coordinates, date and time, technical metadata in the case of photographic contributions etc. The privacy policy should mention how a user's personal information is being handled. This should include an overview of the type of information made visible for other users (e.g. user name, location …). An example from the Zooniverse User agreement and Privacy policy[41]:

"Identifying information: If you register with the Zooniverse, we ask you to create a username and supply your e-mail address. Your e-mail address is not visible to other users, but others will see your username in various contexts. Notably, your username is associated with any classifications or other contributions you make, e.g., on Talk pages. You may optionally provide your real name to be included when we publically thank participants, e.g., in presentations, publications or discoveries."

Mailings

When sending out regular information emails to your registered volunteers, it's important to include an option to unsubscribe from the mailing list at any given time. An unsubscribe feature

[41] See: https://www.zooniverse.org/privacy

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should be included in the footer of each email being sent out. The following information should also be specified in your data policy page:

- To what purpose emails are being sent
- The frequency of the emails
- How a user's personal contact information is being handled (e.g. no transfer of any personal data to commercial companies or other organisations)
- Information on how to unsubscribe from the mailing list

Contributed data

On pages where volunteers are registering or submitting data, it's preferred practice to show the data policy on the same page. Since this can take up space, it's also a possibility to provide a clearly visible link referring to the data policy page on each of the pages where registered users are submitting data. Your strategy should depend on how sensitive your IPR and data privacy case is. As mentioned in User agreements, clickwrap agreements with the full policy information being presented on a single page, is the most legally secure option.

Data security

Especially when dealing with personal data it's important to take necessary data security precautions. The privacy policy section could inform the user about where data is stored, how it's secured (e.g. anonymized), and which people have access to it.

Best practices on Privacy policy

- The section about privacy policy should clearly mention why the data is being gathered and how they are being used
- Include a link to the data policy page on your home page as well as on every page where additional volunteer data is being gathered (e.g. registration page, data submission page…)
- Explain the usage of cookies: what kind of information is collected, how is the information used, with whom it's being shared…
- Explain the usage of personal information: what kind of information is collected, how is the information used, with whom it's being shared…
- A contact address for further questions on policy related topics

For a clearly formulated privacy policy example for a citizen science project, see the Zooniverse User Agreement and Privacy page at https://www.zooniverse.org/privacy.

3.3 IPR LEARNING RESOURCES

Relevant resources	Access
The Clicks That Bind: Ways Users "Agree" to Online Terms of Service	**Website:** https://www.eff.org/wp/clicks-bind-

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Organisation/Author: Bayley E., Electronic Frontier Foundation **Description:** Informative document on user agreements and how online users are notified on the terms and conditions of websites.	ways-users-agree-online-terms-service **Document:** https://www.eff.org/files/eff-terms-of-service-whitepaper.pdf
Developing Community Collections **Organisation/Author:** Jisc **Description:** Presentation of a number of case studies from the projects in Community Collection programmes that had to tackle intellectual property rights and issues with licensing content. The website also references a number of relevant reports.	**Website:** http://www.jiscdigitalmedia.ac.uk/infokits/community_content/guidance/legal-considerations.html
UK Data Archive - Create & Manage data **Organisation/Author:** UK Data Archive **Description:** The UK Data Archive provides information on different best practices in research data management, including how to deal with copyright, consent and ethics.	**Website:** On consent and ethics: http://www.data-archive.ac.uk/create-manage/consent-ethics On copyright: http://www.data-archive.ac.uk/create-manage/copyright
Learning objects on IPR and Licencing **Organisation/Author:** Strategic Content Alliance **Description:** This IPR and Licensing module has been developed by the Strategic Content Alliance for staff working in public sector bodies to introduce to them the concepts of copyright and other Intellectual Property Rights and how they might deal with the rights and licensing issues associated with the curation and creation of digital content. The module has been divided into 6 learning objects divided into key themes: Introduction to IPR and Licensing, Creative Commons Licences, Orphan Works and Risk Management, Digital Economy Act, Accessing and Using Third Party Content, Protecting and Managing Rights	**Website:** http://www.web2rights.com/SCAIPRModule/

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Data policies for Public Participation in Scientific Research: A Primer **Organisation/Author:** Browser A., Wiggins A. & Stevenson R. (DataOne) **Description:** This guide introduces data policies in the context of Public Participation in Scientific Research, or citizen science. Four types of data policies are examined: user agreements, terms of use, legal policies, and privacy policies. Each is briefly explained with examples from existing citizen science projects and best practices for implementation. Practical instructions that describe how to craft data policies for citizen science projects and information on how data policies fit within the data management lifecycle are included.	**Document:** http://andreawiggins.com/wp-content/uploads/2013/10/DataPolicyPrimer.pdf
Typology of Citizen Science Projects from an Intellectual Property Perspective: Invention and Authorship between Researchers and Participants **Organisation/Author:** Scassa T. & Chung H. (Commons Lab, Wilson Center) **Description:** This paper outlines a typology of citizen science projects based upon intellectual property issues that may arise from contributions of the public to a research project.	**Website:** https://www.wilsoncenter.org/publication/typology-citizen-science-projects-intellectual-property-perspective **Document:** https://www.wilsoncenter.org/sites/default/files/Typology_of_Citizen_Science_IP_Rights_Scassa.pdf
BCE: Public, Community and Cultural engagement **Organisation/Author:** Jisc (Jisc Legal Information) **Description:** This briefing gives an overview of some of the legal issues which institutions may face when carrying out cultural and public engagement activities as part of their Business and Community Engagement ("BCE") activities. It is one of a series of JISC Legal publications that aim to raise awareness of the legal issues associated with the use of technology by colleges and universities in their BCE activities.	**Document:** http://www.jisclegal.ac.uk/Portals/12/Documents/120515%20Public%20Community%20and%20Cultural%20Engagement.pdf
Case Studies Mapping the Flows of Content, Value and Rights across the Public Sector **Organisation/Author:** Jisc **Description:** This report is an analysis of seven case studies of publicly funded e-content initiatives, which demonstrate the flow of content, value and rights. It is addressed to senior decision makers across public-sector	**Document:** http://sca.jiscinvolve.org/wp/files/2009/04/sca_2009symp_ipr_casestudies-final.pdf

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bodies and aims at providing a coherent account of best practices of managing publicly funded e-content.	

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4 CONCLUSION

Citizen science projects can bring many advantages to cultural heritage organisations and humanities researchers, for example by allowing them to reach new audiences or enabling them to process larger datasets for their research. However, organisations should also consider what value it can bring to the participant. As the RunCoCo project correctly identified, citizen science should be a two-way engagement, bringing benefit to the organiser and the participant. Part of this deliverable pays specific attention to best practices and learning resources on engaging with citizen volunteers. But there are many more aspects to take into account when planning a citizen science project. Most of the barriers that were identified in limiting the successful take-up of citizen engagement in cultural heritage and humanities research can be tackled by careful planning and preparation. A general conclusion of this deliverable is that organising a citizen science project requires an extensive amount of effort, specifically because of the engagement with a large group of individuals that have received no specific scientific training and lack experience with the tasks at hand and knowledge about the data being collected, transcribed or analysed. Moreover, involving external people in a research project means that these participants also have certain rights on the work they contribute. This is why possible challenges such as the quality of the data, community engagement, availability of IT resources for the development and support of technical tools, data policy and project sustainability should be in place before commencing with a citizen science project. This deliverable provides an overview of learning resources that can help project teams in this planning work.

The research conducted in this task identified a large number of online learning resources on how to organise citizen science projects related to the domain of the natural sciences such as biodiversity. One of the best examples was the 'Guide to citizen science: developing, implementing and evaluating citizen science to study biodiversity and the environment in the UK' covering every step of a project from questions to ask 'Before you start' to the final 'Analysis and reporting phase'. Another great example is the 'Citizen Science Toolkit' provided by 'The Cornell Lab of Ornithology'. This Toolkit is organised in a step-wise approach and each step organizes tools and resources into six categories to aid project teams in the planning of their Citizen Science projects:

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Figure 8: Steps and Categories provided in the Citizen Science Toolkit

Similar high quality learning resources in the domain of cultural heritage and humanities are underrepresented. Moreover, most of the information is available in the form of articles or reports focussing on the outcomes of a specific topic of research or analysis of different case studies. Though these reports provide interesting background information, they are less useful as a practical planning guide. Project websites with the objective of sharing learning resources such as 'RunCoCo - How to run a Community Collection Online' often only focus on a specific type or part of a citizen science such as online collection gathering by using social media and face-to-face engagement at roadshows, but leaving out important information on how to deal with the data ownership of the contributed materials. Cultural heritage organisations and humanities researchers interested in organising a citizen science project could benefit greatly from having access to an online toolkit that centralises relevant information and resources in a step-by-step structure. Such a toolkit could become a single point of information for different stakeholder groups (volunteers, educators, researchers …) interested to find out more about citizen science, how to organise a citizen science project or even how to participate in one. Depending on the incentive visitors should be directed to the information they are looking for: useful tools for audio recordings, access to target communities, existing projects to join. With the 'Registry of resources'[42] and the 'Heritage recordings'[43] website that resulted from the pilot study on place-names and oral history in Ireland, the CIVIC EPISTEMOLOGIES project has started to conceptualise such an online toolkit for the humanities and cultural heritage sector. More work is needed to create a truly useful tool for different types of projects needing different kinds of tools,

[42] Registry of Resources: http://www.civic-epistemologies.eu/registry

[43] Heritage recordings are available from here: http://www.civic-epistemologies.eu/pilot-study

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communities and information. Instead of having to search the internet for relevant step-by-step guides, use cases, links to tools, communities, legal information etc., as had to be done for compiling this report on available online learning resources, all relevant information should be accessible from a single location and organised according to a clear structure that works well for different types of audiences. Such a toolkit should therefore be constructed with the help and input from the different stakeholders that will use and continue to contribute new resources to the toolkit.

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CONSULTED WEBSITES AND WEBPAGES

CIVIC EPISTEMOLOGIES project website: http://www.civic-epistemologies.eu/

Electronic Frontier Foundation: https://www.eff.org/wp/clicks-bind-ways-users-agree-online-terms-service

Europeana portal:

- IPR Guidelines: http://pro.europeana.eu/structure/europeana-ipr

- Europeana Terms for User Contributions: http://www.europeana.eu/portal/rights/terms-for-user-contributions.html?lang=en

European Commission:

- The Directive on Privacy and Electronic Communications (E-Privacy Directive), Article 5(3): http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32002L0058:EN:HTML
- EU advisory body on data protection - WP29: http://ec.europa.eu/justice/data-protection/article-29/documentation/opinion-recommendation/files/2012/wp194_en.pdf
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Zooniverse portal:

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- Kitteh Zoo project builder example: https://www.zooniverse.org/projects/vrooje/kitteh-zoo
- Zooniverse Project Builder Policies: https://www.zooniverse.org/lab-policies
- Zooniverse User Agreement and Privacy Policy: https://www.zooniverse.org/privacy