

THE SOCIO-TECHNICAL SUSTAINABILITY ROADMAP

FACILITATOR'S MANUAL

**A Guide to Leading
Workshops on Sustainability
for Digital Projects**

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DIGITAL DOWNLOADS

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Introduction to the Facilitator's Manual

Table 1: Version 1 of the Levels of Digital Preservation

	Level 1 (Protect your data)	Level 2 (Know your data)	Level 3 (Monitor your data)	Level 4 (Repair your data)
Storage and Geographic Location	<ul style="list-style-type: none">- Two complete copies that are not collocated- For data on heterogeneous media (optical, magnetic, etc.)- Store copies into your storage system	<ul style="list-style-type: none">- At least three complete copies- At least one copy in a different geographic location- Document your storage systems and storage media and what you need to use them	<ul style="list-style-type: none">- At least one copy in a geographic location with a different disaster threat- Obsolescence monitoring process for your storage systems and media	<ul style="list-style-type: none">- At least three copies in geographic locations with different disaster threats- Have a comprehensive plan in place that will keep files and metadata on currently accessible media or systems
File Fidelity and Data Integrity	<ul style="list-style-type: none">- Check file fidelity on ingest if it has been provided with the content- Create fidelity info if not provided content	<ul style="list-style-type: none">- Check fidelity on all ingests- Use write-blockers when working with original media- Virus-check high risk content	<ul style="list-style-type: none">- Check fidelity of content at fixed intervals- Maintain logs of fidelity info, supply audit on demand- Ability to detect corrupt data- Virus-check all content	<ul style="list-style-type: none">- Check fidelity of all content in response to specific events or activities- Ability to replace/repair corrupted data- Ensure no one person has write access to all copies- Perform audit of logs
Information Security	<ul style="list-style-type: none">- Identify who has read, write, move and delete authorization to individual files- Restrict who has authorization to individual files	<ul style="list-style-type: none">- Document access restrictions for content	<ul style="list-style-type: none">- Maintain logs of who performed what actions on files, including deletions and preservation actions	
		<ul style="list-style-type: none">- Store administrative metadata- Store transformative metadata and log events	<ul style="list-style-type: none">- Store standard preservation metadata- Store standard descriptive metadata	<ul style="list-style-type: none">- Store standard preservation metadata
		<ul style="list-style-type: none">- Inventory of file formats in use		

WELCOME!

Welcome to the **Facilitator's Manual for the Socio-Technical Sustainability Roadmap (STSR)**. This resource has been designed to help support you in leading STSR workshops for your communities.

The manual has been developed to offer guidance based on our experiences developing and teaching the STSR to numerous project teams at our own institution and across the country. By keeping the Socio-Technical Sustainability Roadmap open and freely available, as well as sharing our experiences with facilitating it in this manual, we are excited to encourage these workshops to take place more widely and in as large a variety of settings as possible.

Before you facilitate the STSR for others, we recommend that you run the workshop on a project of your own, or one you know very well—ideally alongside close collaborators and other known stakeholders. Running the Roadmap on a project familiar to you will have several benefits. It will give you insight into the participant experience, which you can use to inform your approach to facilitating it for others. Additionally, it will provide you with in-depth knowledge of how the STSR plays out on a familiar project so that you can then have first-hand experiences to use as case

study examples as you teach. In our own practice leading this workshop, we found it highly effective to share such personal examples—including any visuals you might have on hand—when introducing participants to module activities. And finally, you will also certainly find that a test run on your own project will afford you and your collaborators an opportunity to consider your work from new angles and with fresh eyes.

We have greatly enjoyed creating and sharing the STSR and connecting with our workshop participants. We wish you the best of luck as you customize your own approach to this material!



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HOW WE GOT HERE

The Socio-Technical Sustainability Roadmap (STSR) was one of the deliverables resulting from the NEH-funded project, “Sustaining MedArt,” that was carried out between 2016–2018 in the University of Pittsburgh’s [Visual Media Workshop](#) (VMW). The central purpose of the Sustaining MedArt project was to evaluate the current condition of the scholarly website “[Images of Medieval Art and Architecture](#),” also known as MedArt, and to create a sustainability plan for its future.

The MedArt website was—and is—an organized collection of digital images of medieval art and architecture taken by M. Alison Stones (now Professor Emerita at Pitt), as well as her students and colleagues. This online resource began back in 1995, during the earliest days of the World Wide Web, when Dr. Stones and her then-student Jane Vadnal created the site for use as a classroom tool. Quite quickly MedArt developed into a well-known and reputable scholarly repository of images that has since been used by visitors from all over the world, for many different use cases. When Dr. Stones retired from the University of Pittsburgh in 2010, the Visual Media Workshop became MedArt’s steward. The purpose of the Sustaining MedArt grant was to determine the best way to design ongoing support for the site given these changes in responsibility. We also hoped to use our findings to serve as the foundation for a digital sustainability “roadmap” that other developers and creators of humanities-focused digital projects might be able to use.

If you would like to read the full report for the **“Sustaining MedArt: The Impact of Socio-Technical Factors on Digital Preservation Strategies”** as submitted to the NEH Office of Preservation and Access in Spring 2018, it is [available here on the STSR website](#).

The workshop materials presented on the Socio-Technical Sustainability Roadmap website and in this manual constitute the happy result of our outward-facing, community-focused work resulting from the Sustaining MedArt project. We are excited to offer this material in both web-based and print formats, and hope that you will find each useful. By taking your team through the modules

If you would like to read the full report on our workshop series, **“Workshops on Sustainability for Digital Projects,”** as submitted to the NEH Office of Digital Humanities in 2019, it is [available here on the Institute website](#).

in the following units, or leading others through the workshop, you will be helping project teams produce effective ongoing digital sustainability strategies for the work, and/or assess the effectiveness of their current strategies.

In the 2019–2020 academic year, the Sustaining MedArt team received an additional grant from the NEH, this time from the Office of Digital Humanities, to run a series of Workshops on Sustainability for Digital Projects based on the STSR. During this time, we ran the workshop

with 53 project teams made up of 117 participants across 28 states, Washington DC, Canada, the Bahamas, and Guatemala. We draw heavily on this experience to offer you our advice.

OVERVIEW OF THE MANUAL

Just as the process of creating a digital sustainability plan is unique to each project, so too is the process of leading the STSR for project teams. We encourage you to take the tips and advice in the following pages as suggestions, making alterations and adjustments as you see fit based on your own experiences. If you find new techniques that work for you, we hope you will share them widely!

What's included in this manual

In the following pages, you will find the complete text found on the [website of the Socio-Technical Sustainability Roadmap](#), including module descriptions, activity worksheets, glossary, and bibliography. In addition to reformatting the web-based materials into a print-forward format, we have also added a number of notes and pieces of guidance that are specifically designed to help you lead the STSR as a facilitated workshop, whether for one project team or many. These additions include:

- Recommended pre- and post-workshop activities
- High-level facilitation advice for each of the STSR's three sections
- Specific tips for each of the STSR's thirteen modules, including strategies for introducing new concepts, leading module activities, and checking in with participants
- Sample wrap-up questions for guiding large group discussions

We continue to maintain the complete STSR online at <http://sustainingdh.net>, and we encourage you to use the website to access this information as well, especially during workshop facilitation. On the For Facilitator's page in the Introduction section of the Roadmap website, you can also download a number of facilitation resources including:

- A sample slide deck for facilitators
- The spreadsheets required for select module activities
- Additional copies of module activity worksheets to help in the creation of folders for participants to receive
- A nametag template

RECOMMENDED PRE-WORKSHOP ACTIVITIES

Email your participants

After selecting and/or recruiting your participants, we recommend sending them email reminders in the weeks and days leading up to each workshop sharing specific information about both the content of the Socio-Technical Sustainability Roadmap workshop as well as helpful logistical details such as the workshop location and the availability of parking and public transportation. One very important piece of information that we advise facilitators to share is that it would be best for at least one person per team to bring a laptop to the workshop. Computers will be needed for completing a number of module activities that work with digital spreadsheets, as well as for referencing the STSR website throughout the workshop.

Conduct pre-workshop survey

A pre-workshop survey can serve several purposes. If you do not know your workshop participants well, a survey can provide you with valuable insight into the scope of their projects, their familiarity with digital sustainability practices, and their expectations for the workshop. If you are familiar with your participants and their projects, a pre-workshop survey can be helpful in demonstrating where your assumptions may be incorrect, in providing up-to-date project information from all members of the team, and in learning about the participants' expectations for the STSR workshop specifically.

In all circumstances, if you are hoping to assess the efficacy of your workshop, a pre-workshop survey can establish a baseline for your participants' knowledge and goals in advance of the event. Of course, in this case, we recommend using a post-workshop survey to show change over time. You can find our suggested follow-up questions for a post-workshop survey below.

Possible Pre-Workshop Questions

- *What is your primary concern and/or question when it comes to the sustainability of your digital project?*
- *What are the main motivations behind your participation in the workshop?*
- *What are some skills, tools, and/or techniques that you hope to get out of this workshop?*
- *Do you have any questions or concerns for the workshop facilitators? If so, please include them here.*

Prepare folders and name tags

While all of the STSR's content can be accessed online, we have learned that having paper copies of module activities on hand during the face-to-face workshops is very helpful to participants. Prior to each convening, we recommend compiling all of the STSR activity worksheets into folders, which participants can fill out by hand and also use for note-taking during the workshop. These printed materials can then usefully be filed away as project documentation that serves as evidence of the team's decision-making. We also advise pre-printing name tags for the events, or bringing blank name tags and markers, so that participants can share their names and, if desired, pronouns. This is a particularly useful practice when convening people who are not already well-known to one another. A printable set of activity worksheets that can be used to prepare these workshop folders, as well as a nametag template, can be found in the digital downloads on the STSR website and also on the CD-ROM included with the limited print run of this manual.

Stock up on big Post-It notes

We are huge fans of giant, wall-mountable Post-It notes. We use them both for recording responses during section reflections, during large, inter-team conversations, and for making available to the project teams as they work through the modules of the STSR. Additionally, making physical notes at this large a scale allows teams to observe one another's work, which can help to jog their memories or prompt them to think about the activity in new ways. Other supplies that proved to be useful were small Post-It notes, index cards, and markers, which we placed on each table prior to each day's work.

RECOMMENDED POST-WORKSHOP ACTIVITIES

Conduct a post-workshop survey

If you choose to run a pre-workshop survey, a post-workshop survey will help you assess changes in your participants' understanding of digital sustainability practices after having worked through the STSR. Whether or not you decide to conduct a pre-workshop survey, however, asking your participants a few, pointed follow-up questions using a post-workshop survey can help you improve your understanding of the impact that the convening may have had on the project teams.

Consider providing ongoing support

The STSR—particularly when run over the course of two full days—can be a deeply immersive experience for both participants and facilitators. One of the comments we received most frequently from participants was that the experience of having ongoing, dedicated time to connect with their collaborators and discuss their project in detail was in and of itself a great benefit. Throughout our experiences facilitating these workshops, we too have come to see this collaborative working time as a deeply valuable part of the STSR. After this immersive experience, however, project teams may wonder how they will keep up the momentum after they return to their regular responsibilities and schedules. While this will be different for each team, and is ultimately up to them to decide, we have found that there are a few small but meaningful steps that workshop facilitators can take to support that transition.

Perhaps the simplest gesture is to send a post-workshop “thank you” email to the projects offering to answer any follow-up questions they might have. If you do not wish to take on this burden indefinitely, you can provide a time frame in which you are willing to provide direct support to the teams. You might also consider providing follow-up “office hours” over Zoom or in-person (as appropriate to your situation) for your teams to attend. Finally, it can be beneficial—especially for teams who know each other and already have online conversation spaces—to providing online spaces for asynchronous follow-up and engagement.

Possible Post-Workshop Questions

- *Did the workshop respond to the primary digital sustainability concerns and/or questions that you brought to the event?*
- *In what precise ways do you feel more prepared to sustain your projects post-workshop?*
- *What specific skills, tools, and/or techniques from the workshop have you found particularly useful?*
- *Do you have any other questions, comments, concerns, or suggestions for the workshop facilitators?*

GENERAL ADVICE

One slide per module works well (in general)

In the digital downloads for this manual, we provide a slide deck template based on the one we used when facilitating the STSR. We encourage facilitators to make changes and additions to this deck wherever they are deemed helpful. The slides are based on what we have found to be effective, but of course, all instances of the STSR are shaped by the specific group of individuals who are convening.

We have found that projecting one slide per module—rather than having a long series of introductory slides for each—works best overall. There are some exceptions, such as Module A1, where we found that it was helpful to have more than one slide, in order to better illustrate concepts that are unfamiliar to participants. In some other instances, such as Module A5 and the entirety of Section C, you may find, as we did, that pulling up and sharing the actual STSR website is more effective than using slides when you are walking participants through module concepts. You'll see references throughout this guide where increased, or otherwise altered, facilitation may be beneficial.

Take time for personal and project introductions

In our experience we have noted that, particularly in instances when participants do not already know one another and one another's work, a dedicated time period for introductions was greatly appreciated. If your schedule allows, we recommend setting aside time for both personal and project introductions at the beginning of your workshop. In the schedules we offer below, you will see time reserved for this activity.

Personal introductions can take place early on the first day and can be very brief. As an icebreaker, we sometimes asked each participant to respond to three questions:

- What is your name?
- What is your home institution?
- What is your superpower outside of work?

We emphasized that this superpower should be non-work-related—just something, large or small, that they feel they do very well. We appreciated that this gave participants a way to learn something about each other beyond the scope of their professional responsibilities. If you have a favorite icebreaker of your own, you may of course choose to use it in place of our superpower prompt.

Once these personal introductions are complete, we suggest moving straight into Module A1. We have found that project-focused, rather than participant-focused, lightning introductions are much more successful if they are offered after this first module has been completed. Originally, we asked participants to introduce themselves and their projects collectively at the start of the day. However, we realized that the work done in Module A1 helped teams better respond to some of the prompts we offer for these project introductions. Allowing teams to have an hour to discuss the scope of their work was immensely helpful to them as they crafted how to describe their projects to the rest of the group.

After the completion of Module A1, we then ask each project team to share the shape of their work with all participants using the following prompts:

- The name of your project
- The goals of your project
- The main motivation behind your participation in this workshop
- The people on your team, starting with those in attendance
- A brief overview of the technologies you are using

In the situation where a workshop is facilitated for project teams who are already well acquainted with one another and one another's work, these personal and project introductions may not be necessary, or may be abbreviated or altered to suit your specific audience.

Prioritize participant work time

When we first began facilitating these workshops, we strove to be very active, present, hands-on educators during project group time. As the teams worked through each activity, we circulated through the room, frequently checking in on them to see how their work was progressing and to see if they had any questions. Quickly, we found that this was generally not welcomed or desired! Instead, groups relished the time they were able to focus on their project and speak frankly with one another—something that is, unfortunately, a rare commodity on these digital project teams. Participants were eager to discuss the module content amongst themselves and facilitator interventions were often viewed as a distraction, rather than a help.

There are, however, some exceptions to this rule. We found that certain module activities did benefit from more proactive teaching—again, Module A1 being a notable example. We indicate throughout this guide where similar moments of increased facilitation occur. Otherwise, we encourage facilitators to remain present in the room and make themselves available for questions, but to stay to the side while groups work through the module activities so that groups can take advantage of this productive time together.

Make time for large group reflection

In this manual, we have included prompts for reflection after Sections A and C. If you follow the two-full-day schedule that we prefer to use when facilitating the workshop (see [pages 18–19](#)), these times for reflection take place at the end of each day. Whether you follow this same schedule, one of the others we have devised and offered below, or a schedule of your own creation, we still recommend making time for inter-team reflection and debriefing after Sections A and C, as outlined in this manual. You may, of course, feel free to design additional questions to follow Section B, if that suits your needs!

Introduction to the Socio-Technical Sustainability Roadmap

GETTING STARTED

What is this, exactly?

The Socio-Technical Sustainability Roadmap (the “Roadmap” or the STSR) is a module-based workshop intended to help you and your team approach the seemingly daunting task of sustaining your web-based, user-facing, digital humanities project over time.

What does “sustaining over time” mean?

Not all digital project teams plan for their work to last for “BookTime,” that is, for as long as a traditional paper-based codex might last on a library shelf. Digital humanities projects can, and should, have a variety of expectations of longevity, and these expectations should match individual intellectual and technological goals as well as a realistic assessment of funding opportunities.

Some projects might “bloom and fade,” others may be designed to last for the length of an individual scholar’s career, and some may indeed strive to persist indefinitely into the future. But all of these various options are best pursued as intentional plans rather than surprise happenstance. Even the process of ending a project is something that can be done with forethought and integrity. Digital projects might end for a variety of reasons, from an intentional “sunsetting” of the work to a sudden loss of funding resulting in an inability to support the project any further. The Roadmap is here to help plan for any and all sustainability aspirations or exigencies.

When would I use the Roadmap?

The design of the Roadmap is predicated on the conviction that digital project teams need to answer the question, “How long do we want this to last?” at the very same moment as they are formulating their intellectual goals. We therefore suggest that an instance of the Roadmap be run at project inception. However, for digital work, engagement with such questions does not end after project launch, and so working with the Roadmap at any point in the project’s lifespan will be beneficial. Indeed, thinking about sustainability should happen iteratively and at multiple times over the life of a project. Digital project teams need to ask themselves questions relating to their project’s vision, scope, and socio-technical sustainability requirements periodically—we suggest every three years, to be precise.

How does the Roadmap help us work through these issues?

This curriculum incorporates a series of modules that focus on what it takes to sustain a digital humanities project over time, taking both social and technical needs into consideration. The modules are organized thematically and are designed to make up a structured, process-oriented workshop that incorporates design thinking and collaborative-learning approaches. This team exercise, which can be implemented in a variety of institutional contexts, will guide you through the practice of creating effective, iterative, ongoing digital sustainability strategies for as long as your project is scheduled to last, and can also serve as a lifeline should an unexpected change, such as a sudden loss (or increase!) in funding or unplanned change in project staffing, happen. The Roadmap works best when you gather together all of the core stakeholders you can muster: all input is helpful, and most of it is critical when attempting to plan for the future.

OVERVIEW OF THE STSR MODULES

The modules of the Roadmap are categorized into three sections, and it is best to take them in order. Section A is designed to help you scope your project, its vision, and its sustainability goals. Section B provides templates for documenting your staff and your technologies, including their sources of funding. Taking your work in Sections A & B into account, Section C then helps you create a list of concrete sustainability actions to be taken.

SECTION A: PROJECT SURVEY

MODULE A1 *What is the scope of your project?*

This module asks you to scope your project, identifying the ways it manifests itself in various creative outputs, such as datasets, websites, and other research products.

MODULE A2 *How long do you want your project to last?*

This module asks you to consider the duration of time for which you expect or hope your project will last, and offers a few sample timespans to consider. We also propose that there are three primary phases of development into which projects may fall—active creation, ongoing maintenance, or retirement—and ask you to determine which phase your project currently inhabits.

MODULE A3 *Who is the project designed for?*

In this module, we explain the professional archival concept of “designated communities” and guide you through the process of describing your project’s imagined, actual, and unanticipated users.

MODULE A4 *What are the project’s sustainability priorities?*

This module introduces “significant properties,” a professional digital preservation concept. Having identified your designated communities and their potential needs, you can now begin to identify the traits or characteristics of your work which are most essential to its ongoing sustainability in its current and anticipated environments.

MODULE A5 *Project documentation checklist*

Section A concludes with a module that guides users of the Roadmap through some best practices for organizing project documentation in order to bolster effective sustainability. This module is also used to help participants think through how to organize and store the documents created in the course of participating in the Roadmap.

SECTION B: STAFFING AND TECHNOLOGIES

MODULE B1 *Who is on the project team and what are their roles?*

In this module, you are asked to list the contributors to your project—both internal and external to your team—their responsibilities, and their sources of funding.

MODULE B2 *What is the technological infrastructure of the project?*

Just as you identified your project team in Module B1, here you are asked to identify all of the technologies—both local and remote—upon which your work relies, their functions on the project, as well as their sources of funding.

MODULE B3 *Socio-technical responsibility checklist*

This module brings together the work done in the first two B modules in order to provide the participants with an understanding of how their project team and technologies map onto one another. Roadmap participants are asked to document which staff (as listed in B1) are responsible for which technologies (as listed in B2), taking into account how and for how long both the staff and the technologies are funded.

SECTION C: DIGITAL PRESERVATION PLANS

MODULE C1 *Adapting the NDSA Levels of Preservation*

This module provides an introduction to the NDSA Levels of Digital Preservation, a professional framework designed to produce scalable digital preservation strategies, and explains the ways in which we have adapted them for the Roadmap.

MODULE C2 *Access & backing up your work*

This module addresses the first two sustainability areas for the Roadmap: the ways in which creators and users can access and interpret your project and the locations and media used to store copies of your work.

MODULE C3 *File formats & metadata*

This module focuses on creating work in stable, sustainable formats and also making sure that these formats, as well as the rest of your project, are well-documented.

MODULE C4 *Permissions & data integrity*

The final sustainability areas discussed in this section focus on protecting and maintaining the integrity of your work over time, from the platform level down to the bit level.

MODULE C5 *Digital sustainability action plan*

The final module in this section guides you through the process of aggregating the work you have done in previous modules, resulting in a comprehensive list of sustainability actions and their dependencies, both social and technical.

POSSIBLE WORKSHOP SCHEDULES

How long does it take to run the roadmap?

Each module of the Roadmap has a suggested time length of about 30 minutes. The exigencies of your particular project, however, including issues such as its current stage of development and how many changes are on the horizon, will require you to spend more or less time on any given area. The team's native expertise about digital sustainability and preservation plans will also matter. Below, we offer two recommended schedules for facilitating the STSR. One stretches over two half-days, which is good for participants who are familiar with one another's work, and the other lasts for two full days, which is preferable for larger, facilitated, multi-project gatherings.

Schedule: TWO HALF-DAYS

Good for groups and teams that already know one another

Schedule: TWO FULL DAYS

Best for larger, facilitated, multi-project workshops

Why is there no "one full day" schedule?

We do not recommend running the entire Socio-Technical Sustainability Roadmap workshop in one day, but understand that circumstances might require it. If this is the situation in which you find yourself, you could run the schedule designed for two half-days in one, long day. Our reasons for not recommending this plan are two-fold: (1) on this pace, the team(s) will be utterly exhausted before they reach Section C, and (2) we have found that teams benefit from a good intellectual break between Section A and the sections that follow.

why "documentation consolidation?"

You will note that we suggest time for "Documentation Consolidation" at the end of Modules A5, B3, and C5. We would like to draw this action to your attention here (although we will also bring it up within the context of the modules themselves) because one of the most critical outcomes of the Socio-Technical Sustainability Roadmap for your project will be a set of written documents that will allow you to maintain a persistent, shared understanding of the current state of the project's sustainability as well as the plans for the next three years—that is, until the Roadmap is performed again during its next iteration.

SCHEDULE: TWO HALF-DAYS

DAY ONE

8:30-9:00a	SECTION A	SET-UP AND OVERVIEW OF PLANS
9:00-9:30a		MODULE A1
9:30-10:00a		MODULE A2
10:00-10:30a		MODULE A3
10:30-11:00a		MODULE A4
11:00a-12:00p		MODULE A5, DOCUMENTATION CONSOLIDATION, & WRAP-UP

DAY TWO

8:45-9:00a	SECTION B	REVIEW OF DAY ONE
9:00-9:30a		MODULE B1
9:30-10:00a		MODULE B2
10:00-10:30a		MODULE B3 & DOCUMENTATION CONSOLIDATION
10:30-11:30a		MODULES C1, C2, C3, AND C4
11:30a-12:30p		MODULE C5, DOCUMENTATION CONSOLIDATION, & WRAP-UP

SCHEDULE: TWO FULL DAYS

DAY ONE

8:30-9:00a	SECTION A	COFFEE & LIGHT FARE
9:00-10:00a		PERSONAL INTRODUCTIONS & OVERVIEW
10:00-11:30a		MODULE A1
11:30a-12:00p		LIGHTNING PROJECT PRESENTATIONS
12:00-1:00P		LUNCH
1:00-1:30p		MODULE A2
1:30-2:30p		MODULE A3
2:30-3:00p		MODULE A4
3:00-3:30p		COFFEE BREAK
3:30-4:00p		MODULE A5 & DOCUMENTATION CONSOLIDATION
4:15-5:00p		WRAP-UP & GROUP REFLECTION

DAY TWO

8:30-9:00a	SECTION B	COFFEE, REVIEW OF DAY ONE, & OVERVIEW OF DAY TWO
9:00-9:45a		MODULE B1
9:45-10:15a		MODULE B2
10:15-11:00a		MODULE B3 & DOCUMENTATION CONSOLIDATION
11:00a-11:30a	SECTION C	MODULE C1
11:30a-12:30p		LUNCH
12:30-1:00p		MODULE C2
1:00-1:30p		MODULE C3
1:30-2:00p		MODULE C4
2:00-2:30p		COFFEE BREAK
2:30-3:30p		MODULE C5 & DOCUMENTATION CONSOLIDATION
3:30-4:30p		WRAP-UP & GROUP REFLECTION

WHAT WILL PARTICIPANTS TAKE AWAY?

Upon completing the Roadmap, you will have a stronger sense of how to sustain your work, what your intellectual goals are, and what constitutes your project's major characteristics. You will also leave with a detailed understanding of your project's particular sustainability goals and a plan for beginning to work toward them.

In the course of running the Roadmap, you will be asked to complete an exercise for each module. The module exercises are arranged to cumulatively scaffold your sustainability plan. The documentation produced in each module will assist you in making subsequent decisions about the parts of your project that you hope to sustain, for how long, and through what means.

From Section A, participants will leave with the following:

Awareness

- Of how your project's scope and intellectual goals relate to your overall sustainability goals

Documentation

- A list of your project's creative outputs
- Your project's current phase of development and anticipated sustainability timeframe
- A description of your project's user community, and their skills and needs
- A list of your project's significant properties and sustainability priorities
- A spreadsheet inventory of your reliable sites of project documentation, the types of documentation stored in each, who has access to them, and how they are funded

From Section B, participants will leave with the following:

Awareness

- Of the various people and technologies on which your project depends, how they are connected, and how they are funded

Documentation

- A spreadsheet inventory of your project's team members and contributors, their specific roles in relation to the project, and the source and duration of their funding
- A spreadsheet inventory of the technologies used in your project, their function, and the sources and duration of their funding
- A spreadsheet mapping your project's team members, the technologies used, the people responsible for maintaining each technology, and the sources and duration of funding for each

From Section C, participants will leave with the following:

Awareness

- Of areas that contribute to sustainability, and specific tasks within each which can be taken to support your project over time

Documentation

- A list of your current and desired sustainability levels in six areas
- A spreadsheet detailing specific sustainability actions to be taken and the team members responsible for them

SECTION A

Project Survey

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SECTION A

FACILITATOR'S INTRODUCTION

Each section within the STSR is important and frames significant components of a project's ongoing sustainability plan, but we place particular value on "Section A: Project Survey." Hands down, this is the section that most project teams find the most useful, even inspiring. Reviewing the possible workshop schedules outlined in the introduction to this manual, you can see that we suggest dedicating substantial time to this section no matter how long you plan to convene. The project survey allows the teams time—that many have not had before—to think through the overall goals of their work in the context of how they plan to sustain it over time. Indeed, when possible, we give Section A as much time as Section B and Section C combined.

Similarly, while each section of the Roadmap should be completed in its entirety during a facilitated workshop to make sure that the participants get the most from the experience, we feel that this is particularly true of Section A. This section, known internally as "secret project management training," introduces key terms that become the lingua franca for the remainder of the workshop. These include terms such as "sites of production" (Module A1), "phases of development" (Module A2), "designated communities" (Module A3), "significant properties" (Module A4), and "reliable sites of project documentation" (Module A5). In addition, during the wrap-up session at the end of Section A, we also often introduce the notion of "sustainability red flags," a concept that participants often cited as helpful in their exit surveys.

As it happens, Module A1, as it currently exists, was not originally how we had wanted this workshop to begin. When we started out, our team felt very sure that Section A should begin with what is now Module A2 ("How long do you want your project to last?"). One of the central theoretical underpinnings of our approach to digital sustainability was (and is) that it is a liability to assume that all digital projects should last for the "indefinite future." To be sure, some projects should be maintained on an ongoing basis, but others might simply be allowed to bloom and fade. We had reason to believe from our research that the assumption that all projects should be maintained for the indefinite future stemmed in part from the fact that project creators were rarely directly asked, "How long do you want this to last," and so we wished to begin there.

While we still firmly believe that our original desire to begin with this question proved theoretically sound, in practice after our first round of user testing, we quickly learned that many project teams do not necessarily have a strong sense of the boundaries of their project and are unable to answer the question of how long they want "it" to last. We can easily understand how this happens, as it is common for digital projects to stem from and bleed into so many other types of work in the humanities. However, without a strong understanding of how the project team defines the boundaries of their project, it is almost impossible to come to a consensus about what parts of the work the team is willing to sustain or, indeed, who is responsible for which parts of the project. When this is the case, sustainability begins to look overwhelming, if not impossible. A good spur to action is simply to ask the team to spend some time defining the project before proceeding with the rest of the STSR, and for this purpose we have found the concept of sites of production, as introduced in what is now Module A1, to be helpful. Teams will then be well prepared to answer the critical question posed by Module A2, "How long do you want your project to last?"

FACILITATING MODULE A1

Module A1, which helps teams define the boundaries of their digital project, is a foundational component of any successful sustainability strategy. We recommend providing a full hour for this module if possible.

Spend time discussing the concept of sites of production

We recognize that the concept of “sites of production” presented in this module may appear abstract and difficult to comprehend at first. However, once understood in practice, a project’s sites of production become quite concrete and indeed are often identified by locating and describing the discrete, physical deliverables produced by the team (as demonstrated by the activity found in this module). When facilitating Module A1, we recommend teaching this concept by using example sites of production that belong to a project of yours, or to a project that you know well. Tangible examples truly help convey this concept.

Emphasize that teams should focus on one site of production at a time

In addition, emphasize for your participants the importance of focusing on one site of production at a time when working through the STSR. So, during a two-day, facilitated workshop, each team will most likely be working on the sustainability plans for only one site of production total. Different sites of production will likely need to persist for different lengths of time, and will almost certainly have different sustainability needs. Biting off more than you can chew is yet one more way that the sustainability planning process can fail. It is important to recognize that it is hard work to create sustainability plans, and one can become easily overwhelmed when trying to work on an entire project all at once through this lens.

By telling participants in advance that Module A1 will allow them to see all of their sites of production—that is, to see the full scope of their project—but that they

will then need to pick just one of them to work on during the workshop, you will not only be helping them frame their efforts, you will also be establishing a working pattern that happens repeatedly over the course of the Roadmap, that is, beginning by thinking expansively, and then mindfully deciding on an area of focus.

Encourage groups to designate leaders

Module A1’s activity is designed to get people excited about their projects, both intellectually and technologically. Thinking about your work at the 30,000-foot level, and then moving down to specifics, logistics, and project goals is one of the most valuable parts of this conversation. We suggest that each team designate a discussion leader within their group for this activity because the expansiveness of this module will often reveal how different the project looks to each participant. A free-form conversation that leaps from place to place will not look the same as one with an empathetic and knowledgeable leader who frames the conversation intelligently. We suggest that the person who knows the scope of the project most accurately is often the most effective facilitator for this activity, but each team will know best who might lead the most productive conversation.

Check in with project teams frequently

We have found that it is helpful for workshop facilitators to mill around the room and check in with project teams more frequently in Module A1 than in other modules. Participants often have questions about what constitutes a site of production, and they benefit from the opportunity to discuss how this concept applies to their work. You may find that it is even helpful to have multiple workshop facilitators checking in with the groups during this module, especially if you have a number of project teams in attendance.

What is the scope of your project?

Before getting started with the Socio-Technical Sustainability Roadmap, you will first want to define the precise scope of the project currently under consideration. While this may seem a simple request, determining the shape and parameters of your project can be quite complicated. Digital projects can be superbly multi-faceted, and can manifest themselves via any number of creative outputs, which we call sites of production. These sites could include, for example:

- A user-facing Wordpress website
- Project code stored in GitHub
- A digital exhibition in Omeka
- A dataset in XML
- Internal digital tools built by project staff
- Conference presentations, slide decks, or written publications

As you go through the modules of the Roadmap, you'll be asked to consider questions such as who your project is designed for, what parts of it are most important to sustain, who is responsible for its technologies, and how it is funded. Many of these questions can be answered differently for different parts of a large-scale digital project. In order to respond to these questions effectively, therefore, your team will need to decide—and agree on—what specific digital components of your project you are addressing as you work through this iteration of the Roadmap.

Some, or all, of your digital project's sites of production may be fair game for your work with the Roadmap, but we highly suggest that you run this workshop on one of them at a time. Assessing multiple digital manifestations of your project in tandem might seem to allow for some efficiencies, but it often creates confusion about priorities in and among the different outputs you are discussing. It can also be quite overwhelming.

Project Name:

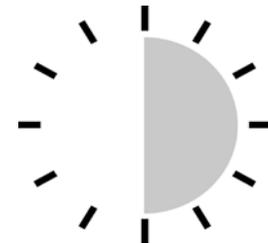
Date:

Section A: Project Vision

Module A1: What is the scope of your project?

Overview

Digital projects can be superbly multi-faceted, and can manifest themselves via any number of creative outputs, which we call sites of production. These outputs could include, for example, a public-facing website, a dataset, an in-gallery exhibition with digital components, and/or written publications whether online or in-print.



30-45 min

Some, or all, of your digital project's creative outputs may be fair game for your work with the Roadmap, but we highly suggest that you run this workshop on one of them at a time. We suggest beginning with the one with the most user-facing importance for your team.

Activity

Working as a group with a designated facilitator, or on your own if you are working solo, make a list of your project's different creative outputs, using the following questions to get you started:

- Where are the access points for your project? Is there only one? Where there are different access points, there are often different creative outputs.
- Have you created different project deliverables to serve unique purposes or reach specific audiences? Different deliverables can signal different manifestations of your project.
- What different workflows do you have on your team? Do they correlate with different creative outputs?
- How do the intellectual goals of your project manifest themselves? Do they appear together in one creative output, or are they distributed across many? How does your data flow through your project? Is it analyzed and presented in a single way, or a variety of ways? As the data changes shape, it can signal different manifestations of your project.

Once you've made an exhaustive list, determine which of your sites of production you will be considering in this instance of running the Roadmap. Feel free to write your consensus-based decision below, as well as at the top of every worksheet provided.

FACILITATING MODULE A2

Although it may seem counterintuitive, once you know the scope of your project, the development of an effective sustainability plan begins best by thinking about endings. When you know exactly how long you want a project to last, you are then much better equipped to make effective and specific action plans that serve your goals.

Remind participants they only need to plan for three years at a time

When our research demonstrated that we should recommend revisiting sustainability plans every three years, we expected strong resistance to this relatively rapid cycle of revisions. However, we have been surprised to find that this three-year cycle has been almost universally well-received. One of the central benefits of these three-year intervals is that they relieve project teams of having to think about “forever” when crafting sustainability plans—they only need to ensure that they are keeping this three-year window in mind when making decisions and implementing plans.

You can begin with either phases of development or project lifespans

We have found that the best use of the facilitator’s time in this module is to get right to the heart of the matter—verbally defining the different phases of development and project lifespans offered to the participants. You can introduce either of these concepts first. We have tried both ways, and both ways work. We suggest taking the read of the room. Project teams will have reported out some of their concerns already. What do they seem most concerned with? Start there.

Encourage groups to think independently and then discuss together

As we note in the activity description, this module’s activity is particularly productive if the team answers questions individually before discussing them as a

group. The variety of responses that arise from this modified think-pair-share approach are highly revealing. Since teams will begin this module by thinking individually about their current phase of development and their desired project lifespan, we find that projecting a slide with a clear list of both the phases and the lifespans is helpful for the participants to refer to as they respond to the questions and discuss their answers as a group.

Introduce booktime as just one of many possible lifespans

In this module, you will be asking project teams to consider a critical but difficult question, one that many may wish to avoid explicitly answering: how long do you want your project to last? As we met with more and more teams, it became very clear that, for many, the default answer—and the one that appeared to be the most comforting—was “We want the project to last as long as books last in libraries.” But how long is that, you might then ask! The assumption is that books last in libraries for an indefinite period of time. Because of this common (somewhat misplaced) sustainability analogy, we began to denote this ongoing, indefinite span of time as “BookTime.”

“BookTime” is thus a term we have coined to denote a project lifespan equivalent to “as long as a paper-based codex would last in the controlled, professional conditions of a library.” BookTime may be assumed to be coterminous with “forever,” but that belief relies heavily on a number of latent expectations about the nature of libraries, the inherent affordances of paper and glue, and other infrastructural dependencies. Reminding participants that a project (or a book) truly only lasts as long as it is maintained is the fundamental key to this module—if they desire for their project to last for BookTime, then they will need ongoing help. This usually means that the participation and assistance of archivists and other digital preservation professionals will be essential.

How long do you want your project to last?

Regardless of where you are with your project, from taking the first exciting steps or ambling through the project's nth year of existence, it is essential to think about how long you want your project to last. If you are conscious of the desire or need to keep your project sustainable for a certain, known period of time, it is more likely that you can successfully implement a correspondingly precise plan for carrying that out.

Here are some factors to keep in mind as you think through an honest answer to “How long do you want your project to last?”:

- The intellectual goals of your project
- Available funding sources
- Current and future staffing
- Preferred technologies

This list of concepts will return again and again over the course of the Roadmap's modules, and it is good to start thinking about them now.

Sustainability goals are not one-size-fits all

In fact, because staffing, funding, technologies, and goals can all change for expected and unexpected reasons, **the iterative, three-year cycle of the Socio-Technical Sustainability Roadmap** is an opportunity to reassess your own expectations of project longevity on a consistent and continuing basis. Moreover, if thinking about the long, distant future of your project seems overwhelming or daunting, it is also worth noting that this same three-year cycle can be a baseline sustainability goal for any project. Any longer life span could be reduced to a series of three-year increments, if this suits your needs and your priorities.

What phase of development are you in?

Before jumping into a discussion of the overall desired lifetime for your project, it is a critical first step to become familiar with the basic phases of digital project development, and also identify what phase you are currently working within. There are three main phases for you to consider:

- Active Creation (including planning/renewal/recreation)
- Ongoing Maintenance
- Retirement

It is important for you to note that the overall digital project development cycle can be described so simply, and it is also important for you to identify which phase you are currently in—or between which two phases you are moving. Knowing what your current goals are will be key to understanding what you should plan to do to sustain your project over the next three years (that is, until the next iteration of the Roadmap).

In order to help you identify where you are right now, we offer some of the management activities or technological strategies that project creators or teams may be undertaking in each phase. We have categorized some, but certainly not all, possible project tasks to give you an idea of the wide variety of actions that could be taking place. However, you will see that many of the actions like, “containerization,” could certainly take place across any number of phases.

Active Creation

In this phase, a project’s vision, working parameters, and overall characteristics are in the process of being developed or updated. This includes all necessary planning activities as well as active implementation. It is utterly critical to note that, for digital projects, “Active Creation” is not limited to the time of original inception. In general, if you are **transforming** your project, either in terms of its intellectual content, or its technological infrastructure, you are in this phase.

When you are actively creating your project, you could be **starting from scratch**, in the process of **adapting** it from a previous incarnation, **translating** it to a different intellectual environment, or **reimplementing** it within a new technological context. You could be in the process of **reinterpreting** your data or your findings. You could even be **regenerating** the work on any number of different levels, from its argumentation to its methodology to its collection of data. It is critical to note that professional digital preservation behaviors such as migration (moving a project between similar technological infrastructures) and emulation (re-contextualizing a project within a virtualized historical technological environment) are also all acts of (re)creation.

Containerizing a project as a technique for facilitating ongoing sustainability is an approach currently being investigated by a handful of professional organizations and scholarly working groups. This activity would also be categorized as belonging to the “Active Creation” phase due not only to its parallels to the process of emulation, but also because of the large numbers of decisions, actions, and changes that need to take place in order to successfully containerize a project.

Ongoing Maintenance

After active creation, digital projects enter a phase of ongoing maintenance in which regular, **non-transformative** activities to sustain the project are undertaken. These activities may include software updates, maintaining hardware and operating systems, updating incorrect or outdated content, or other such behavior. Ongoing maintenance is required to ensure the integrity of an emulation or container, as well.

Depending on your expectations for project longevity, “Ongoing Maintenance” could last for days, months, years, or decades. However, as the name suggests, a strategy of ongoing maintenance requires dedicated staff and resources to actively pay attention to maintain a project, even if their actions are consistently minor or non-transformative. Ongoing maintenance sustains a project’s full functionality and compliance with current system standards and needs.

Retirement

When your project moves to a state of no longer being actively managed or maintained, and has by all accounts “ended,” it is moving towards retirement. While ending a project may seem a more cut-and-dried affair than actively maintaining it, the reality is, of course, more complicated. The end of a project is not always at the forefront of a creator’s mind in the early planning and development phases of a digital project, though there are many advantages to developing end-of-project plans with its ongoing sustainability in mind. The “Retirement” phase is the transition from “Ongoing Maintenance” through to either **graceful degradation or proactive removal**.

Graceful Degradation

“Graceful degradation” is a project state in which you allow your work to persist for the foreseeable future by maintaining only its most basic functionality, allowing components to fail or become obsolete. While it is true that there will never be no maintenance necessary to keep a digital project available to users, the state of graceful degradation is defined by its utterly minimal interventions and accepting partial failures of the total system in due course.

Another way to decide if your project is entering a graceful degradation is by looking through the lens of your proactive project goals: in this next three-year Roadmap cycle, will you be re-entering the “Active Creation” phase through emulation, migration, containerization, or any other means? Will you be committing to sustaining your project at an “Ongoing Maintenance” level? If not, you will want to think very seriously about beginning a graceful degradation. By choosing not to maintain your project to its fullest extent, you will begin to lose functionality that will be very difficult to reimplement the longer you wait to perform necessary maintenance work.

Removal

As the name suggests, this strategy consists of the active, deliberate removal of a project from its previous point of access. This may mean taking a website offline, delegating access to services such as the Internet Archive, or deleting a hosted account. In this phase, project managers will still need to determine whether or not to select any project components for long-term, proactive preservation elsewhere. Module A4 can guide you through the process of figuring out which parts of your work are the most important to you, and therefore the most important components for long-term preservation. You can have different sustainability goals for different parts of your overall project, but by selecting some segments for preservation but not others, you are in effect creating a new project with this new subset of features that will then need to be sustained in its own right, over time.

Should you be deciding to remove your project from active circulation, we would highly recommend that you store all of your project's long-standing documentation in a place that can be securely accessed by all appropriate members of your project team, and (if applicable) your institution. The future will be interested in your work.

Digital project lifespans

Just as there are three basic phases of digital project development, there are three main digital project lifespans to consider in the context of the Roadmap. Your expectations of longevity rest on the foundations of your current phase of production as well as your future plans for renewal.

Projects expected to be in the active creation or ongoing maintenance phases for fewer than 3 years from today

These projects could either be meant to “bloom and fade,” that is to be created and retired within three years, or they could be longer-term projects headed towards retirement.

Example: The Gallery of Lost Art (2012–2013)

This online exhibition, curated by Tate, designed by ISO, and produced in partnership with Channel 4, existed for one year. The project team set an expiration date for the website at the outset, and remnants of the exhibition now exist only through documentation. The team no longer maintains the exhibition site itself, including its interactive components and hyperlinks.

Projects expected to be in the active creation or ongoing maintenance phases for longer than 3 years, but with an expectation of eventual retirement

These projects could last anywhere from 3 years to 100 years, but they are not intended to be sustained indefinitely. Each time the project team runs the Roadmap, they should assess this project for its current needs and possible retirement date.

Example: Anti-Imperialism in the United States, 1898–1935 (????–2008)

Jim Zwick’s project housed a vast collection of primary-source literature, political cartoons, poetry, pamphlets and writings, as well as historical analyses by Zwick and other authors. Zwick died in 2008 and the website disappeared with him.

Read more: Joseph Yannielli, “The Long Goodbye,” Digital Histories @ Yale (2015), <http://digitalhistories.yctl.org/2015/12/18/the-long-goodbye/>.

Projects that are expected to be in the active creation or ongoing maintenance phases for longer than 3 years, but that have no current plans for eventual retirement

These projects, slated to last “forever” or for “BookTime*,” live on with the assumption that they will last for as long as is possible with no planned retirement date. This expectation of ongoing longevity is important to identify because such projects might more productively participate in professional-grade sustainability practices that also tend to make assumptions of indefinite preservation.

Example: Perseus Digital Library (1985–????)

This project, hosted by Tufts University, continues to evolve and grow. The funding history and related publications are well documented on the website itself. Further information can also be found on the NEH funded projects site.

* **“BookTime”** is a term we have coined to denote a project lifespan equivalent to, “As long as a paper-based codex would last in the controlled, professional conditions of a library.” It may often be assumed that this is coterminous with “forever,” but that belief relies heavily on a number of latent expectations about the nature of libraries, the inherent affordances of paper and glue, and other infrastructural dependencies.

Project Name:

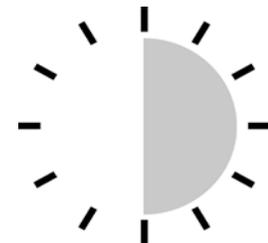
Date:

Section A: Project Vision

Module A2: How long do you want your project to last?

Overview

In this module, you and your team will have the time and space to think through two critically important questions related to your work's sustainability: How long you want your project to last? What phase of development does your project currently inhabit?



30-45 min

Activity

Working individually, consider each of the project lifespans and project phases described in Module A2 and take some time to write down answers to the guiding questions provided below. Please note that if you are finding that you are working with more than one expectation of longevity or more than one phase of development, you are probably tackling multiple creative outputs and might productively revisit your work in Module A1 with this in mind. After about 5 minutes of work, reconvene (if applicable) and discuss your selections. Then, as a group, determine consensus-based responses to the questions and document them on a new, blank worksheet for recordkeeping.

1. How long do you want your project to last, that is: what is your anticipated digital project lifespan?
2. Why have you chosen this lifespan? Intellectual goals? Financial reasons? Staffing reasons? Technical reasons? Other reasons?
3. What phase of development would you currently say your project is in? How long has it been in this phase? How long do you project that it will continue in this phase?
4. What is the next phase of development you foresee for this project? When do you think that the project will enter this phase?

FACILITATING MODULE A3

In this module we introduce a concept, “designated communities,” adapted from professional digital preservation, that directly serves the “end game” of the STSR—that is, the creation of a professional-grade, actionable, sustainability plan.

Introduce designated communities

When stewarding a project for the long term, professional archivists typically have to imagine who the designated communities for a preserved object or collection originally were. It is therefore hugely beneficial when creators have thought about and are able to communicate who they consider their designated communities to be, both for their own project management purposes but also when depositing their project for long-term, professional stewardship.

Some information professionals do take issue with the concept of designated communities, because to designate one community over another as the primary audience for a project risks potentially foreclosing other audiences. However, we believe that a focused, thoughtful examination of those communities who are intentionally, or actively not intentionally, being served by an active project is a necessary part of producing a manageable sustainability plan. A secondary benefit of identifying designated communities is that it also helps teams to identify users the project wishes to reach, but who are not yet being served, and then to make plans to address that gap.

Ask participants to get specific

We have found that it is important in Module A3 for the facilitator to remind project teams of a few key ideas when introducing the concept of “designated communities.” First, many teams will identify the “public,” or worse, the “general public,” as one of their desired audiences. It is vital to note that this idealized

user group is much too broad a concept to be useful. Instead, emphasize the importance of being as specific as possible. Second, it is often beneficial to remind participants that their project—especially if it is posted on the open web—will have many unanticipated users or perhaps even users who engage with the project in unanticipated ways. We found that this notion of unanticipated users often generated a great deal of discussion among our participants. Finally, this module is also a wonderful opportunity to talk about the ways that user studies can help project teams identify their actual audiences rather than their imagined or idealized audiences. It is one thing to hope to reach the people you want to reach and another thing to know that you are being successful in doing so!

Remember, project teams are users too

And finally, do not forget to say out loud that the project teams themselves—the people participating in this very workshop—are a designated community (or maybe even multiple communities) for their own projects. This user group should not be discounted in its importance, especially for projects driven by humanistic inquiry.

Be prepared to answer questions about usability studies

Module A3 encourages project teams to run usability studies on their work to better know their audiences and their audiences’ needs. The module activity itself does not re-emphasize the importance of usability studies, but perspicacious participants may come to you for advice on the subject. We recommend having a few of your own favorite resources to offer them, beyond those listed on the STSR. If you have conducted your own user studies in the past, sharing your experiences with curious project teams will undoubtedly enhance this module.

Who is the project designed for?

Designated communities

Since the late 1990s, the professional digital preservation community has been working with, and iterating on, a large-scale reference model for their work called OAIS (the Open Archival Information System). OAIS offers a “10,000-foot” view onto the process of producing a professional-grade preservation infrastructure designed to maintain digital assets under the strictest standards of persistence.

Many of the activities we ask you to perform in the course of the Socio-Technical Sustainability Roadmap have the OAIS model in mind. While we certainly do not expect digital project managers to undertake, or even to keep in mind, the full scope of activities assigned to digital preservation professionals within OAIS, we believe that the more your work aligns with it, the better.

One of the central concepts embedded within OAIS is that of the “designated community.” Designated communities are those groups of people that are proactively kept in mind while making the inevitable onslaught of decisions it takes to preserve digital information for the long-term. Effective digital preservation is often a case of making informed decisions about what should be preserved and what can be left to the past, and it is best to be very mindful of who you are making these decisions for. You will be introduced to another OAIS concept, “significant properties,” in Module A4 that also confronts these issues directly.

Within the OAIS model itself, the concept of designated communities is not without issues. While there is little resistance to the notion that it is not feasible to design a system that will effectively serve every single person on the planet equitably forever more, the very act of intentionally excluding any possible audience is a less-than-ideal state of affairs for a profession as committed to accessibility as digital preservation.

Nevertheless, through the concept of designated communities, OAIS acknowledges that the task at hand simply cannot be to design a system that meets every single possible person’s information needs, present and future. Indeed, from the point-of-view of a project creator, the notion of designated communities aligns well with the notion of a user-oriented digital humanities design process.

You will almost certainly have a certain audience in mind as you design and develop your digital project. The purpose of this module is to ask you to put words to your assumptions about who you would like for your audience to be, and to articulate what you would like for them to get out of your work.

It is also worth noting that, at the end of the day, should your project eventually be transferred to a professional data steward, they will be very interested to hear what you believed your own designated communities to have been, and will be able take that information into consideration as they design their own ongoing preservation plan.

Usability testing

We have found that users are relatively flexible and adaptable, but they can also be agents of change. That is, their expected and unexpected needs can indeed end up changing your approach, making your work more accessible, impactful, and attuned to current audiences. But this positive feedback loop can easily remain invisible to project managers unless you end up with very vocal new audiences.

In order to find out how people are interacting with your work, we suggest you perform consistent usability testing on your site, perhaps even on a similar three-year cycle to the Roadmap. While this work is beyond the scope of the Roadmap itself, we highly encourage you to learn more about what it takes to run such a study. It need not be incredibly time- or resource-intensive. Some work can be done through an investigation of the web analytics you may be already gathering. Other types of information can be gleaned by survey, and yet further details can be gathered by interviewing specific people with particularly intriguing uses of your project.

Two fantastic resources for learning about the process of usability testing are:

Amy J. Ko, "How to Evaluate Empirically," in Design Methods, 2020

faculty.washington.edu/ajko/books/design-methods/empirical

18f, "Heuristic Evaluation," methods.18f.gov, 2022

methods.18f.gov/discover/heuristic-evaluation

Unexpected communities

As is so often the case, what we predict will come to pass rarely equates to the reality of our lived experiences. Especially if your project is web-based, it is common sense that unexpected audiences might very well engage with your work for a variety of reasons you cannot predict.

Indeed, user studies performed as part of the research for the Socio-Technical Sustainability Roadmap have suggested that the more varied, and sometimes unexpected, the audiences for web-based projects are, the more sustainable they might become. In brief, this is because the ongoing engagement of different user communities spurs additional thinking on the part of the project team, driving attention towards what the project needs. These findings are consistent with those published by Fred Gibbs and Trevor Owens in 2012 in their work, "Building Better Digital Humanities Tools."

Project Name:

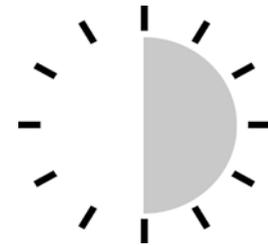
Date:

Section A: Project Vision

Module A3: Who is the project designed for?

Overview

You likely have an audience in mind for your project. Understanding audience and their needs will help you make decisions about your priorities.



30-45 min

Activity

Spend 5 minutes writing down each of your imagined user groups on individual post-its or index cards, employing the following questions as prompts for description:

- Who do you imagine using your project?
- Why do you imagine they use it? What needs do they have?
- What do you imagine they get out of it?

Once this is completed, spend an additional 5 minutes doing the same exercise for your *known* user communities. **Note:** you definitely have at least one – the project team itself!

- Who uses your project?
- Why do they use it? What needs do they have?
- What do you imagine they get out of it?

Using the cards and post-its you've made as springboards for analysis, take a few minutes to sort through and arrange cards in logical groups. Come to a consensus (if applicable) about who your imagined and actual users communities are, and then decide together what needs they have of your project, and how your project satisfies those needs. You can have many user communities, but keep in mind you'll want to ensure you can support their needs sustainably (You'll work more on what this decision implies in Module A4). If you like, feel free to use the table on the back of this worksheet to consolidate your findings.

Prompts for discussion:

- If you have chosen the “general public” for any of these user communities, could you be more specific about the types of people you feel constitute that group?
- How does your project meet the needs of your users, whether actual or imagined? What skills and knowledges do you assume your users have that would allow this interaction to succeed?
- Have you done usability studies to find out how your users engage with your project?
- Who might you have as unanticipated users? What other publics have access to your work?

Project Name:

Date:

Section A: Project Vision

Module A3: Who is the project designed for?

User Community	Needs	How are their needs met?

FACILITATING MODULE A4

Like Module A3, this module introduces another important concept from archival science and professional digital preservation practice: “significant properties.”

Pay special attention to introducing significant properties

In our experience leading the STSR across the United States, we have found that the concept of significant properties often requires a bit of extra lecturing before the module’s activity can be productively attempted. We scaffold this concept by discussing the archival triad of context, content, and structure. Content is often the easiest of these to grasp—context and structure can be more challenging, and generally require more explanation. The text of the module provides an excellent starting point for this conversation. Because each member of a team may feel that different aspects of the project are the “most significant,” the framework of content, context, and structure has also proven to be an effective way of exploring how we identify and assign value to specific components of a digital project.

Teach from the activity

After introducing the concept of “significant properties” by way of content, context, and structure, we have found that shifting over to teach directly from the activity worksheet is particularly effective for this module. This is also a moment in which sharing an example of significant properties from a project of your own is an excellent strategy for increasing comprehension and effective engagement with the module’s activity. It is best to think of Module A4 as something that must be attempted to be understood in its own way. After you have presented the concepts

and have taught the activity, set the participants free to try things out! They will surely come to you with questions as they arise, and will be actively learning as they go along.

Think expansively, and then focus on priorities

Another helpful piece of advice is to remind participants that during this module they are charged with first listing all of the components of their project before focusing in on their priorities. Just as in Module A1, when the teams thought expansively about their sites of production before selecting one for the purposes of this workshop, here they begin by getting all possible properties, functions, and/or features of their project out on the table. As a team, they will then decide which of these properties are most significant, and will therefore receive greater attention in the sustainability plan. It is crucial to work from as exhaustive a tangible list as possible, however, before deciding upon these priorities.

Allow for many questions

While presenting this material, stopping for questions frequently is important. This is one of those modules where a more hands-on, active engagement with the work of the teams can pay off. Be sure to let your participants know that Modules A3 and A4 are particularly taxing, and in fact, may be focused on principles that participants have never had to think about before. These modules introduce concepts that are particularly archival in nature, and they ask participants to make difficult decisions about value and priorities. Remind them that these conversations will pay off handsomely when they come to Section C.

What are the project's sustainability priorities?

When thinking about sustaining your project over time, it is important to recognize that, as a persistent information object, your work has a number of different conceptual parts. Indeed, some of these components may feel more important to maintain to you than others. This module is designed to take you through the process of thinking about the basic, informational building blocks of user-facing digital humanities projects and how you might wish to sustain them, even differentially, over time.

Content, context, and structure

At the most abstract level, all complete information objects—such as your digital project—have three main components: content, context, and structure. There are a number of ways that you can decide that these three characteristics are distributed across your work, but we offer here a general model of how they tend to fit together.

Content

Content comprises any narrative argumentation inherent to your project as well as the data used to make the argumentation tick. Content is often considered to be the intellectual “meat” of a project, and it certainly often is, but without context and structure, it is incredibly difficult to interpret and understand your content appropriately within the scholarly scaffolding of your particular point of view. That scholarly scaffolding will be made up of both technological and discursive parts.

Context

Context comprises the information needed to understand how your project operates institutionally, technologically, and socially. For example, what discipline(s) does this work belong to? What is the institutional environment in which this project was created and sustained? Who is its audience and how do they interact with the project? Who is in charge of the intellectual argumentation? Where did the data come from and who does it belong to? What technologies were used to run this project? Often, contextual information is organized and contained by the various metadata structures within your project, but it can also, importantly, be found in the external recordkeeping systems (paperwork) surrounding your work.

Structure

Structure comprises the operational components that make your project function. In the main, a web-based, user-facing digital humanities project will have three major structural pieces: its data, its technical stack, and its interfaces (presentation layer). Data is, of course, also part of a digital project's content, but here we are thinking of it as a structural component of the technological architecture rather than as the interpreted content that serves as evidence of the intellectual labor of the work. Each of these parts of your project's structure may be more or less critical to the work as a whole. Not all digital humanities projects are structured the same way. As a preview of upcoming Roadmap activities, Module B2 will take you through the process of thinking through your data storage, your technical stack, and your presentation layer more closely.

Significant properties

As you work through these three different aspects of your project—content, context, and structure—this module will mainly focus on identifying which exact components and sub-components of your work, such as particular technological features, interfaces, or interpretive scaffoldings, are more critical to the overall project than others. This analysis will result in a list of your work's "significant properties," also sometimes talked about as "significant characteristics." "This term, which carries a great deal of weight within the professional digital preservation community, designates those parts of your project that are critical to its intellectual and technical goals."

To think this through, begin with the question, "What are the features without which your project simply would not be your project?"

It may be shocking to think that there might be components of your project that are more significant than others, and it may be the case that all parts of your project are equally essential. However, it is certainly worth the time to go through and decide this intentionally. Many long-standing digital humanities projects may, for example, have processes and products that were put into place by previous project participants and that are no longer mission-critical. These components would then receive different types of attention when it comes to sustaining the project as a whole.

Make Mindful Decisions

Having gone through the process of identifying and prioritizing the significant properties of your project can lay the groundwork for making mindful decisions about how much time, effort, and money to raise and spend on any particular sustainability goal. As we move forward with the Roadmap, the work of having thought through how your project is structured and what parts of it are most important to the team will pay significant dividends.

Project Name:

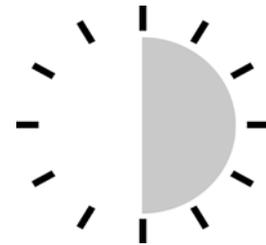
Date:

Section A: Project Vision

Module A3: What are the project's sustainability priorities?

Overview

Your project's significant properties are those characteristics that are critical to its intellectual and technical goals. In this activity, you'll begin by generating lists of as many facets of your project's content, context, and structure as you can, and then continue by refining those lists so that they contain only the most essential elements.



30-45 min

Activity

Break into groups of two and spend 10 minutes brainstorming answers to the questions listed below which help you identify features of your project's content, context, and structure. If you are running the Roadmap solo, you can, of course, do this individually.

- What is your project's narrative, argument, or mission? Where and how do your intellectual goals unfold?
- What information is your project intended to convey? How does it convey it?
- How do you define your project's institutional context? What are its contours and features?
- What are the structural components of your project?
- What about your project's chosen technologies and/or digital interactivity is most salient to you? What forms does it take?

Significant Properties

Then, reconvene as a group (if appropriate) to discuss your answers for a few minutes before focusing on these final questions, which help you identify your project's significant properties, the roles they serve on your project, and the designated communities they serve. As you fill out the columns on the next page of the activity worksheet, keep in mind that the "Function on the Project" column tells you why the significant property is important, while the "Designated Community Served" column tells you to whom it is important.

- Of all the things you have listed so far in this exercise, what are the features without which your project simply would not be your project?
- Which seem utterly essential to your overall intellectual and technological goals?
- And, recalling your work in Module A3, which of these characteristics seem most essential to your designated communities?

Also be sure to retain a list of those properties that you proactively deem to be nonessential—this is also valuable information.

Project Name:

Date:

Section A: Project Vision

Module A3: Who is the project designed for?

Significant Property	Function on the Project	Designated Community Served

FACILITATING MODULE A5

In this module we talk quite a bit about “right-sizing” project documentation and creating “reliable sites of project documentation.” What does it mean to over- or under-document your work? How can you be sure you can find the information you need when you need it while working on a team with multiple people? The right amount of documentation will be different for every group, and it is the purpose of this module to figure out this balance.

Teach from the website, and then move to the activity

We have found that pulling up the website to talk through each subheading of this module (“Keep the Number of Locations Small,” “Keep the Folders Simple,” etc...) is very helpful to participants. This is also another module (like A4) where teaching from the activity after discussing the module content can be very helpful. In this case, it not only allows the facilitator to review the activity with the participants, it allows you to model the process of downloading the associated spreadsheet as well. You can then teach from that spreadsheet and discuss each of its components, which directly connects the abstract concepts presented on the website to the practical work requested by the activity.

Introduce reliable sites of project documentation using your own project as a case study

The STSR team had successfully used the practice of creating “reliable sites of project documentation” in their own collaborative work for years prior to embedding it into the workshop. Because we use our own system as an example on the website, we were able to teach Module A5 by projecting the STSR website text and using it to explain how we organized our own

documentation, adding verbal examples from our own particular lived experiences. We were also then able to pull up our team’s bonafide digital recordkeeping system and show the participants our folder structure, demonstrating how we used our principles in practice. We emphasize, of course, that this is the system that works best for us, and since your project is not the exemplar found on the STSR website, our method of presenting Module A5 may not be the best approach for you. If you and your project team have a method for organizing your project documentation that works well, we heartily recommend you using it as an example instead of, or in addition to, our own.

Not everything needs to be a reliable site

It can be easy to assume that “if it is important, it must be a reliable site of project documentation.” But this is definitely not the case, and it is worth emphasizing this point. Not all tools we use need to be reliable sites of project documentation. There are spaces and documents that can just go away. For example, teams may enjoy drafting work in Google Docs, but do not have Google Drive as one of their reliable sites. No problem! The work they do in Google Docs is their draft work, and when it becomes a record copy it should simply be filed in one of their appropriate reliable sites. It can be particularly important to verbally differentiate between tools or sites used for communication and those used for ongoing storage and access. Remind participants that services such as Slack or email are great for communicating with collaborators, but they are probably not where they will want to go searching for project-critical files. Finding a balance between ensuring accurate project documentation and working the way the team wants to work on a daily basis is critical to the success of any project.

We work “at the pleasure of Google”

On the spreadsheet associated with this module, you will note that the example text in the “Funded how?” column reads, “Example: At the pleasure of Google.” While many project teams are quite cognizant of the positive funding streams coming into their project, we have found it to be the case that they do not always recognize how much of their work relies on the “free” services run by Box, Google, Microsoft, or other major tech companies. We ask teams to be very frank with themselves and note all of the sites of project documentation that are supported “at the pleasure” of some other corporation—including their own university.

Sustainability red flags

This all said, it is also critical to note for your participants that reliance on these “free” services is merely one of many sustainability red flags that they will identify on their project. It does not mean that it will all necessarily end in catastrophe! There are sustainability red flags on every single digital project, whether large or small, well-funded or run on a shoestring budget. Sustainability success does not arise from eliminating all red flags, as this is practically impossible. Instead, sustainability success arises from knowing where these red flags are and having a plan ready to address them should they become a problem. Participants can use a reminder of this true definition of success frequently throughout the remainder of the workshop.

There is no one right way

Part of the power of this module comes from the bond of empathy developed between the facilitators

and the participants that recordkeeping is hard, situated in individual project teams, and yet somehow fundamentally essential as a challenge for us all. In our experience, we have found that many participants simply want to be told how to keep their records, but that can be the absolute worst way to keep project records because such “advice from the outside” does not take into consideration the particularities of each project’s workflow. Emphasize for the participants that they need to use the tools their team wants to use to work, and store the documentation in places they will communally agree to maintain.

Project teams crave records management advice

Because we are trained as records managers, when we created Module A5 with its focus on effective records management, we firmly believed that these concepts were deeply important to the success of the Socio-Technical Sustainability Roadmap. We were concerned, however, that the project teams would not share this belief (or our interest!) and would not find these principles to be engaging or their importance immediately transparent. However, each time we have presented this module, we are surprised again and again at how eagerly it is received. So hungry have our participants been for direct, functional advice about maintaining records systems, our experience teaching this module has convinced us that there is a need, and even a desire, for more records management training in the humanities.

Project documentation checklist

Effective sustainability plans require effective project documentation

If your team has already created a sustainability plan for your project, whether by means of having run the Socio-Technical Sustainability Roadmap before or by other methods, you are well on your way to seeing your work persist for as long as you want it to. This module focuses on making sure that your sustainability plans, as well as your general project activities, are well-documented. Effective project documentation is the foundation for any sustainability plan as it allows for past decisions to be communicated to future project team members without relying solely on interpersonal or institutional memory.

If your team has not yet created a clearly documented sustainability plan for your project, the Socio-Technical Sustainability Roadmap should set you on your way. You may have noticed that each module asks you to create some form of written documentation. Some teams may prefer paper-based documentation, while others may prefer digitally-stored documentation, but either way, creating a recordkeeping system for your project is the backbone of your sustainable success.

If this is not your first time through the Roadmap, and you have already set up a system for project documentation, please use the time allotted for this module as your opportunity to consolidate any past documentation that may have gotten away from you and to assess the effectiveness of your recordkeeping system for your team.

Reliable sites of project documentation

Knowledge production and dissemination, particularly within the context of team-based digital scholarship, necessitates the coordination of a complex communication network. In a collaborative, interdisciplinary space, data is gathered and research is conducted in a variety of environments, but **meaningful information is best ultimately stored in a reliable, shared location.**

Within the specific context of the Visual Media Workshop at the University of Pittsburgh, we have been proactively working on a communal and consistent system for storing the documentation that emerges in the process of conducting our collaborative research. Although each researcher has their own data-collection and drafting processes, the team is making a concerted effort to apply a common strategy to its communal research documentation by using the concept of “reliable sites.” Reliable sites of project documentation designate those locations that we agree are **communally-kept and community-essential**, and they are therefore watched over by us all. We all also commit to keeping these locations filled with timely, reliable, and accurate information. In our practice, we have found that there are a few keys to maintaining effective “reliable sites,” and we offer ours below.

Keep the number of locations small

The fewer places there are to find a document, the more likely it is that the document will be found. Conversely, the fewer places there are to store a document, the more likely it will be stored in the appropriate location that is accessible to all.

In some environments, you may be using a cloud storage infrastructure such as Box, OneDrive or Dropbox, in others you may be using a local network drive to share information. In yet others, Google Drive or a physical filing cabinet will be used as the location to store documents. In any or all such situations, we would like you to consider that the issue is not where you store your information, but in how many different locations you store the information. **We highly recommend consolidating your reliable sites of project documentation into the smallest number of places possible.** These will then become your go-to places to look for and to store the work that needs to persist over the long-term.

Keep the folders simple

One way to think about beginning a plan for effective, communal project documentation is to consider implementing a simple, but consistent, file folder structure for your digital documentation. Humanities projects are as variable as they are numerous, and so it is not likely that there is a one-size-fits-all approach that can be made to work for every team. That said, the following division of documentation has worked well for a number of projects here in the Visual Media Workshop, and we offer it to you as a possible model. We not only encourage you to adapt and adjust as needed, we know that such changes will be almost necessary.

In our process, we have found that **keeping the number of top-level folders low is utterly key.** Each double-click is both a decision and a commitment, and to encourage good recordkeeping behavior, it should always be as clear as possible which folder will contain the information sought and, conversely, in which folder the information is best stored. Records managers call these “big buckets,” and they are designed to capture large-scale project concepts rather than finely-tuned ideas that can rarely, if ever, reflect all of the highly personal understandings of a project.

The following set of four top-level folders has proven quite useful in our lab-based, team-focused work:

Articles - Books - Links

It may be easiest for humanists to think of this folder as the location for the secondary source information salient to your work. Distinct from the data (primary source material) used by the project, this folder could, on some projects, be conflated with its “Bibliography,” and on others with its “Library.” In the main, because this folder is shared by numerous people, we have found that subfolders in the Articles-Books-Links folder work best when associated either with the main intellectual themes of your project or with the work of individual researchers on your team. Zotero is a commonly-used online platform that works a bit like this folder, and it can certainly be used for this purpose.

Data

This folder contains the actual data used to power the digital project. This information could take any form, and might also simply be copies of the data being used on a separate web platform. Alternatively, it could contain past drafts and iterations of the data. Be sure to label this information as accurately as you can at every step of the way. You may think you'll remember why this or that particular spreadsheet was created, but without descriptive metadata, that decision-making process will almost certainly be lost to the sands of time.

Organizing your data is a large and critically important component of the sustainability of your project. The published work of professional data stewards and data curators can be your guide, but if you happen to be able to work directly with one of these information professionals, they can offer you unbelievably salient advice about the best ways to store your data in order to keep it accessible and usable for the foreseeable future—even after you might feel that you are finished with it yourself!

Process Documentation

This folder contains all of the administrative documentation for your project. You may have, for example, correspondence with your web host or memos traded with your department chair. This is also the location you might consider storing any project management information that you might choose to export from a project management platform, such as Asana, or an inter-team chat platform such as Slack (see below for more on these technologies). This folder would also be an ideal site to store the documentation created during the Socio-Technical Sustainability Roadmap.

Sites of Production

This folder has proved to be, hands-down, one of the best innovations of this recordkeeping system for the collaborative work of the VMW. It basically correlates to the notion of “creative outputs” as covered in Module A1. As noted in that module, larger-scale digital projects are often multi-faceted and usually have more than one, single, user-facing manifestation. Digital humanities project teams are, for example, expected to present results at conferences, create different types of articles and books, produce exhibitions, and other such project deliverables. In this folder, you might therefore consider making a subfolder for each. Examples might include, “NEH ODH Grant 2020,” “DHQ Submission,” or “AHA 2019 Presentation.” Within these folders can then be found all of the bespoke or custom-created work needed for these particular instantiations of your work.

Back Up Your Reliable Sites

Often, when participants first hear the phrase “reliable sites of project documentation,” they assume we mean technologically reliable, and we do! Including your reliable sites of project documentation as part of your back-up plan is part of the work of “Module C2: Access & Backing Up Your Work.” However, to reiterate, a truly reliable site is one that is known to, actively used by, and accessible to all appropriate team members. The more intelligent, focused attention a site has, the more reliable it becomes.

Drafts and Working Documents

As you think through how to store your project documentation, you might find that you have preferences about where to store your records based on where you are in the drafting process. For example, here in the VMW, we use OneDrive as our reliable site to store final, definitive project records, but we prefer Google Docs to draft and work on documents collaboratively while drafting. In this situation, we have policy to transfer our documents out of Google Docs and into OneDrive once they reach their distributable form. Otherwise put, we do not consider Google Docs to be a site of reliable project documentation, only OneDrive.

While it might be ideal for us to begin using the collaborative Microsoft Online features that come coupled with OneDrive, the project team does not like the affordances of this workflow. In cases such as these, your **recordkeeping processes will always need to strike a balance between finding a consistent way to document the team's work and striving to minimize its impact on the way the team wants to work.** Recordkeeping failures are often tied to asking the recordkeepers—that is, the whole team in this context—to perform inconvenient or burdensome activities.

Project Management Information and Interpersonal Communication

Project management platforms, such as Asana, provide an excellent venue for assigning tasks and tracking active projects. Here in the Visual Media Workshop, we do not consider the information created and stored in Asana as a reliable site of project documentation. If we want to maintain a record of what is going on in that platform, we will export that information, date it in the filename, and add it to the “Project Documentation > Asana Exports” folder in OneDrive. And, to be frank, we rarely do!

However, you could certainly feel free to deem project management platforms to be a reliable site of project documentation for your project. The trade-off here is a balance between multiplying the number of places you go to look for information, and keeping the information stored in the very systems that produced it. Either way you go will be fine, if the decision is made mindfully. Simply make sure that your choice aligns with the preferences of the team, and also consider that, while you can more-or-less control the persistence of the data that is stored on your shared server, you cannot control if and when Asana goes offline, shuts down, or is sold to a new company with different priorities.

Slack, to an increasing degree, provides a chat environment that is both efficient and effective for brief, but nonetheless significant, exchanges of information amongst project teams and even entire intellectual communities. Just as with Asana, we do not consider Slack to be a reliable site of project documentation in the VMW. If you will, we treat it a bit like we used to use the phone, back in the day. If decisions are made, they are documented outside of Slack and stored accordingly. You can feel free to decide otherwise keeping in mind the caveats above.

Marking copies of record

Because drafting and documentation processes vary so widely across project teams, and it is also often the case that “future you” will want to know less about the drafting process than the final documentation process, you may find it helpful to **design a way to denote proactively which documents and/or folders contain information documenting bonafide decisions** that the team has made on the content, context, and/or structure of your project.

Email

Please do not forget to consider that giant morass of communally inaccessible records that can be your personal and professional email accounts. If your team is in the habit of making major decisions over email, it would behoove you to create a reliable site of project documentation for this information. It is even possible to create a team email account to which final decisions are sent and to which all appropriate members of a team have access. If you do this, please note that you are creating a reliable site of project documentation and it should be cared for accordingly.

If you choose to keep record copies of your email interchanges outside of an email system, do make sure that, wherever the emails end up, the names and email addresses of all senders and addressees are maintained, as well as all dates, and all attachments. As a heads-up, it can be relatively difficult to do this by printing to paper/PDF due to the variability in the types of attachments you might be receiving via this mode of communication.

Project Name:

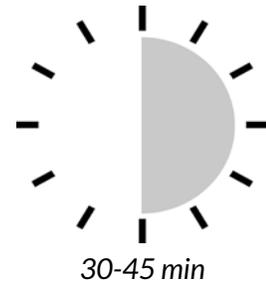
Date:

Section A: Project Vision

Module A5: Project Documentation Checklist

Overview

Your project may have any number of different creative outputs and you may store your documentation in idiosyncratic ways, and that's OK! However, whatever the shape of your work and however it is documented, it is critical to the sustainability of your project that this documentation be stored in a reliable location — where reliable means that it is known to, and accessible by, all appropriate team members.



Activity

If you are working as a group, choose a discussion leader to guide your conversation. Spend 10 minutes and generate a list of every one of the places where your project documentation lives, and what sorts of records reside there. Think long and hard about this. You may use the Excel spreadsheet we have provided to create this list, or if you prefer, create your own brainstorming diagrams, charts, or maps. Examples of locations and record types are:

- Working drafts in Google Docs;
- File folders in Dropbox;
- File folders on a university server;
- Data visualizations on a web server;
- Documentation in GitHub repositories;
- Communication in email accounts or Slack;
- Printed documents in filing cabinets.

After creating as exhaustive a list as possible, take the remaining 15-20 minutes to determine which of the many sites you use to store your project documentation are to be considered reliable sites of project documentation.

As a reminder, reliable sites are those recordkeeping locations that all team members agree to care for and use consistently. This facilitates both knowing where to store any given document and also knowing where one might be expected to find it. Keep in mind that you want to narrow down the number of reliable sites to as few as possible, while still maintaining an overall system that works for your team.

You should also list the general types of documentation that will be stored in each reliable site, as well as who on the team should have access to it. We also heartily encourage you to note how these storage locations are funded, especially including those sites that are currently “free of charge.”

POST-SECTION A

PROMPTS FOR GROUP REFLECTION

In Section A, we talk a lot about project management, both directly and indirectly. We ask project teams to consider many facets of their work, to think about its long-term lifespan, and to consider who uses it and why. What parts of the project matter most to these users and which users matter most to the project team? We also ask teams to think about the many places where their work lives. Where are data stored? And what about project documentation? The work of locating sustainability red flags has only just begun, but its rewards are clear. This work can feel expansive and exhilarating, but also sometimes overwhelming. Many of the lists generated in these modules seem to have no hard edges or clear endings. At the end of Section A, taking a time to wrap-up provides a moment when participants can be reminded of all that they have learned.

We begin the process of group reflection by asking our participants to think about their experience of working through these modules through the lens of the following questions:

What was easy and what was difficult?

What was surprising?

We give the assembled community a few minutes to consider their answers to these questions, and then we ask them to raise their hands and let us know what they found. Often, we ask folks to begin with the “easy/difficult” question, but usually the participants simply answer the question they feel most comfortable answering, and as the conversation progresses the relationship between the questions (and the answers to the questions) becomes clearer and clearer.

As the participants speak, we write their responses to these questions on big post-it notes hung on the wall. This allows the different teams to see and learn from the diversity of each other’s expressions and experiences. The act of reflecting on what was learned or realized throughout Section A also helps to make these lessons stick. It also, hopefully, leaves the teams feeling accomplished and motivated to come back for Sections B and C.

As facilitators, this exercise can also help you take the read of the room. It is an excellent opportunity to make sure that the participants are engaged, responding well to the process, and that the work is clear to them. Numerous concepts from Section A will come up in this conversation, and you will be given a chance to clarify and expand on those ideas that seem most pressing to these particular participants. If your experience is anything like ours, sustainability red flags will almost certainly be one of them!

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Staffing and Technologies

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SECTION B

FACILITATOR'S INTRODUCTION

Against the background of the expansive work done in Section A, the modules in Section B ask participants to get down into the details of their projects and really think about how day-to-day work gets done. There are three modules in this section, each associated with a spreadsheet that the project teams will fill out as they document the people and technologies upon which their work depends. Module B1 focuses on the project team members, Module B2 focuses on the technologies that make up the project, and Module B3 draws these pieces of information together as the teams identify how their people and technologies relate to one another.

One of the underlying themes of Section B is that sustainable practices rely just as much on knowing who is on your project as what technologies it comprises. In many ways, Section B is the socio-technical heart of the STSR, bringing thinking about the social together with the technical in very practical ways. The outcome of this section, after all, is a single spreadsheet on which team members, whether they be individuals or corporate entities, are mapped to the technologies they are responsible for maintaining. And if those technologies underlie the significant properties that were identified in Module A4, then this work can ensure that they are getting sufficient attention from the team, a focus that can reap huge sustainability rewards.

Section B also begins the work of demonstrating how different components of the process of sustaining digital projects intersect. From the three-year iterative sustainability cycle that we recommend, to the funding cycles that the projects may undergo, to an understanding that corporate entities may have a larger role on your project than you assumed, to seeing the ways that the varying needs of people and technologies align and conflict, this section is designed to make this incredibly complex socio-technical system more tractable in order to facilitate effective sustainability planning. It is not quite enough, for example, to know which members of the team are responsible for what technologies, participants also need to think through the time frames on which their team and their technologies change. Section B helps with these sorts of ongoing, iterative planning conversations.

While most teams probably spent roughly the same amount of time to complete most modules in Section A, the time needed for each of the B modules will vary more widely from team to team. It is helpful to note this variation at the onset of this part of the workshop lest anyone feel that they are not doing a good enough job as other teams around them take longer to complete this work, or vice versa. Facilitators may also opt to walk around and check in with those teams who seem to wrap up earlier than others to ensure that they have considered the prompts as capaciously as possible.

FACILITATING MODULE B1

Here in the first module of Section B, workshop participants engage with the hands-on task of documenting who is on their team and their roles on the project. While this may seem a straightforward request to many, this module nonetheless reveals to most teams that their projects are more extensive and complicated than they had initially imagined.

Teach from the website

When introducing this module, and all of the modules in Section B, we have found that spending less time (or even no time) with a slide deck to be most effective. Instead, we have traditionally projected Module B1 from the STSR website directly onto a screen visible to all. As in Module A5, this allows the facilitator to not only review the module's posted content for the participants, but also to model the process of downloading the spreadsheet. Once the spreadsheet is open on the screen, it then becomes quite easy to demonstrate and explain the function of each column.

Start with people, not their roles

Facilitators would do well to emphasize that the process of filling out all of the spreadsheets associated with Module B is intended to be as self-explanatory as possible. In the case of Section B1, project teams should use their working time to brainstorm every possible person or corporate entity who contributes to their project. We do recommend that participants begin by listing all of the people on the team rather than their roles, as this has proven to be much easier to do accurately! From there, the assignment of roles to individuals or organizations can follow. And, of course, single individuals can have multiple roles and single roles can be shared by multiple individuals.

Service providers are team members, too

Teams often begin by listing those project team members who are attending the workshop, and we feel this is a fantastic place to start. As a next step, they often move to team members employed at their same place of work—another excellent idea. We recommend that the facilitators also encourage participants to list any service providers that they rely upon—including tech companies and developers, from Google to Box to GitHub—as part of their project team. While these team members may not be seated at the table with workshop participants, if the project relies upon the work of the people employed at those companies, then those companies are on their team! Identifying all such corporate participants during Module B1 is a reminder to all that digital project work relies upon a complex network of contributors, not all of whom you directly interact with consistently.

Don't forget to mention funding

Ongoing project team funding is of course a central concern for many, and is an essential component of sustainability planning. What is sometimes lost in the shuffle is that it is not just the amount of funding available, but also the grant cycle of project funding that can produce sustainability red flags. As participants move through all three modules of Section B, they will be well-served by proactively articulating the ways that the (1) 3-year sustainability cycle proposed by the STSR, (2) their staffing and funding cycles, and (3) the cycle of technological obsolescence and turnover intersect. An explicit understanding of how these different cycles work together produces the foundational conditions in which ongoing, consistent sustainability becomes feasible.

Who is on the project team and what are their roles?

Identifying project team members

Identifying the current members of a project team, associating them with their specific responsibilities, and then writing this staffing information down in a safe place is critical to the ongoing sustainability of a digital project. Keeping such records is useful not only for clarifying the duties of current team members, but also for providing documentation that may be required by future project managers or custodians. Additionally, knowing who is on your team and what they are responsible for doing allows you to better control access to the various technical systems and project assets under your team's control, allowing you to keep your project as open as you like, and yet as secure as is necessary.

In this module, identifying who is on your team and defining the overarching responsibilities of each team member is the main priority. In the next module (Module B2), you'll be asked to think through the different parts of your project's technological infrastructure and the sort of work it does for you. In the final module of this section (Module B3), you'll do the more focused, granular work of mapping the responsibilities of the appropriate project members onto the ongoing technical requirements of those specific technologies.

The exercise we have designed for this module is aimed at pooling all of the institutional knowledge of the assembled group in order to produce the most inclusive and exhaustive list of project participants possible. From there you can, as a group, do the work of identifying and/or defining the specific roles and responsibilities for both the key team players as well as all of the other stakeholders.

All this said, it is sometimes hard to define who exactly is on "your team." We would like you to think very broadly about this subject. You should include here everyone with a stake in your work. These stakeholders might range from your department or division heads to any user groups (as identified and discussed in Module A3) that contribute directly to the project, say, via crowdsourcing. They can also include any corporate bodies that "do work" for your project such as Google, GitHub, web hosting services, or the like.

Once the exhaustive project team has been identified, it will be important to ask:

- What are the precise responsibilities of each team member on the project?
- How is each person funded?
- How long is this funding (and/or assigned attention) expected to persist?

Institutional Partners

Note that it is important to keep in mind that members of the project team can also be institutional partners and representatives of institutional infrastructure. To reveal these stakeholders, it is worth considering what aspects of the project are reliant on institutional support. For example, does the institution allow for administrative staff time to be spent on this project? Do they provide equipment, digital space for storage, or physical space for meetings or outreach? Are you relying on institutional IT service providers for your server space?

Institutional support can play a large role in how a project is run in both formal and informal ways, and it is critical to call out this participation proactively. Doing so can help you avoid unnecessary sustainability pitfalls associated with loss of funding and institutional regime change. When you know where your support is, you can make contingency plans for its eventual evolution.

Extra-Institutional Partners

Also note that there are possibly members of your team that are not employed by your own institution. Frequent examples of this sort of team member might include collaborators from other institutions, collaborators who are independent contractors, external server space providers, and web-hosting services. Please consider everyone who contributes to the content, context, and structure of your project to be part of the team. They will all have critical information to contribute to your project and sustainability work to do.

Project Charters

When it comes to assigning roles to the members of your team, one common way to codify roles and work assignments within Digital Humanities projects is the Project Charter. The Project Charter is a guiding document generated (ideally) at the start of a project and is updated periodically. Indeed, you can take advantage of the three-year cycle of the Socio-Technical Sustainability Roadmap to also refresh your Project Charter.

In their basic form, Project Charters generally include the project name and scope, the names and roles of project members, a timeline, and expected deliverables. It provides team members with an opportunity to explicitly think through and discuss aspects of project management and collaboration that are often implicit, and therefore can be easily forgotten. When maintained as a living document, the charter is an active reminder of project goals, priorities, and policies, and can be used to document how each of these changes over the course of the project from start to finish. For more on project charters, including templates and examples, see: Bethany Nowviskie's *Chartering a Path*; Emory University's *Creating a Project Charter*; Stewart Varner's *Project Charter*; and the Digital Humanities Library Group *Project Charter*.

Project Name:

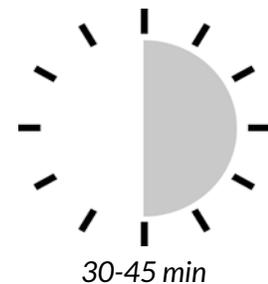
Date:

Section B: Staffing and Technologies

Module B1: Who is on the project team and what are their roles?

Overview

Identifying the current members of a project team, along with their roles and responsibilities, is critical to the ongoing sustainability of a digital project. The exercise we have designed for this module is aimed at pooling all of the institutional knowledge of the assembled group in order to produce the most inclusive and exhaustive list of contributing stakeholders possible. From there, you can communally do the work of detailing their specific roles and responsibilities.



Activity

Take 5 full minutes to make an exhaustive list of everyone you believe to have a contributing stake in your project, and what you feel their stake is. If there are enough of you, please break up into groups of 2-3. If there are fewer than 4 participants, do this work individually.

Your analysis might start with the people who are participating in this workshop, and should extend to institutional stakeholders and the larger corporate entities who provide technologies and/or content to your work (e.g., Google, GitHub, Reclaim Hosting, etc...). Please also include any user groups that contribute directly to your project, via crowdsourcing for example. The job is to brainstorm every single person (or corporate body) that does work for your project.

When complete, regroup (if appropriate), compare notes, and make a final accounting of what constitutes the entire set of contributing project stakeholders, abiding by the consensus of the group. Spend the rest of your allotted time doing this part of the exercise. It is best to do this work in the Excel spreadsheet template we provide for this module, which asks you to identify:

- Project members and their titles
- Their responsibilities on the project
- The source(s) and duration of their funding

In addition to working from the module spreadsheet, visualizations and mind-mappings are heartily encouraged.

FACILITATING MODULE B2

Once you have introduced Module B1, the task of introducing Module B2 is fairly straightforward. The work of each of the modules in Section B follows a similar structure, and so they tend to become increasingly intuitive as they progress. As with the first module of this section, you may find it helpful to teach from the STSR website rather than slides.

Refer back to significant properties

Identifying all of the technologies used by a project can be overwhelming. We recommend that project teams begin this work by referring back to the significant properties that they identified in Module A4. What technologies (hardware, software, and data) underpin those significant properties? Structuring progress this way will also allow project teams to begin the work of identifying their most essential technologies first, which will become useful when making decisions about their sustainability priorities.

Rely on the expertise of project technologists

In our experience, one of the more challenging aspects of Module B2 is deciding just how granular to be when populating the activity spreadsheet. It is helpful to remind participants to be as specific as is needed to be functional, but no more. If the technologist(s) on a project team is/are present during the workshop, this person will be able to help the rest of the team decide how detailed to be in their documentation. This conversation is also a moment when we have seen technologists truly light up and animatedly contribute their knowledge, as the STSR affords them the opportunity to reveal the depth of what it is that they do to an audience that often does not have the time,

or the collaborative context, to be ready to hear the amount of work it takes to keep technological systems ticking.

Projects large and small often share similar fundamental technologies

Smaller project teams have frequently let us know about their nervousness to participate in the STSR workshop alongside larger, more established groups. These more compact projects sometimes feel that their work is not as complex or, somehow, in need of as much sustainability energy. However, it is during Module B2 that it becomes clear to all that to become a digital humanities project—especially those made available on the internet—at any size entails a not insignificant number of foundational technologies that are shared by projects large and small. Numerous smaller teams have left this workshop secure in the knowledge that they share more project characteristics than they could ever have thought with larger-scale, nationally-funded teams.

Remind participants that they're only thinking 3 years ahead

When completing the Module B2 activity, participants may begin to express some concern about the long-term sustainability implications of the myriad technologies upon which their work clearly depends. This can be an overwhelming realization, and we have found that it is helpful to remind participants at this point in the process that they do not need to worry about sustaining this technological infrastructure “forever.” They need only look ahead to the next three years.

MODULE B2

What is the technological infrastructure of the project?

Documenting your technological infrastructure

In addition to documenting the members of your project team and their responsibilities, you will also benefit greatly from documenting both the internal and external technological infrastructure on which your project relies. There are three main areas of infrastructure on which we would like you to focus:

- Data
- Software, including server software, operating systems, and presentation layer applications
- Hardware, including the machines that you own, “use for free,” or rent

In the next module, Module B3, we’ll walk you through the process of mapping your project staff (as identified in Module B1) to the technologies you’ll be identifying here.

Data Infrastructure

The data that underlies your project may be found in a variety of places and may take on a variety of forms, depending on the shape and scope of your work. If you have created data-driven visualizations, for example, the data that makes those displays tick is clearly a critical part of your project. It may reside in a number of physical locations, from the server used to display the visualizations to your audience, to a variety of back-up locations scattered across your technological infrastructure. Now is the moment to take stock of where your data is located. Referring back to your work listing your “Reliable Sites of Project Documentation” in Module A5 may be helpful to you now.

To take another example, your project may also be a website with a great deal of narrative content, such as the website you are reading now, the Socio-Technical Sustainability Roadmap itself. The data for this project is textual in format, but no less essential to the ongoing health of the Roadmap project than quantitative or geo-spatial data might be to another. We have the text found on each of the pages as well as the downloadable content to consider. Indeed, the data of these types of digital projects can often be thought about as closely connected to the “content” discussed in Module A4, and is part of the essential information that makes your project yours.

Software Infrastructure

The software that you are using to support the features of your project can run the gamut from web platforms to finely-tuned system environments to stand-alone analytical tools to mobile applications. We are asking you to consider here all of the different types of software that you need to use in order to make your project tick. For web-facing projects, there is often more to the software infrastructure than simply (if such things can be simple!) the platform or service used to host its public-facing form. If you're doing text analysis work, for example, you may have used tools such as Voyant or MALLET. If you are visualizing data, perhaps you've used d3.js. Maybe you've used Mapbox to plot geographic data points. It benefits your project in the short and long term to ensure that you have access not only to all of the documentation for each of the pieces of software you have used, but also, perhaps more critically, documentation of how you have implemented it.

Hardware Infrastructure

The data and software for digital projects have to be stored somewhere, as does all of your project documentation. Where, physically, is your project stored? Where are your records stored? Do you use personal or university-provided server space? Perhaps your project is supported by a paid hosting service like Reclaim Hosting, or maybe it's hosted by a freemium platform such as Omeka.net or WordPress.com. Are you using Amazon Web Services (AWS) for cloud storage or for virtual servers? It is critical to note that your hardware infrastructure does not always necessarily show up as a fixed cost in your budget. Are you reliant on Google Drive or any other online system that you do not directly pay for? GitHub? However it's stored, you'll want to document where your projects are physically located, as well as how and for how long these storage solutions are paid for, even if they are currently "free."

In this module, you'll want to identify the following pieces of information about each technology used on your project:

- What is the function of this technology on your project?
- How is the technology funded, and for how long will that funding last?
- How long will this technology be required by your project?

If you run the Socio-Technical Sustainability Roadmap as suggested, please do note that you will be updating this information every three years, so keep that time frame in mind as you do the mapping. Part of the reason we chose this iterative time frame is that technologies change dramatically over the course of three to five years, and so you will best keep on top of developments if you check back in consistently. Unless your desired longevity is fewer than three years, the three-year cycle is a good one to rely on.

Project Name:

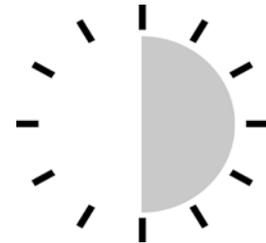
Date:

Section B: Staffing and Technologies

Module B2: What is the technological infrastructure of the project?

Overview

Once you have documented your project team and their roles, you'll want to undergo a similar process of documenting the various technologies used in your work. Remember to consider each of the three areas introduced in this module: data, software infrastructure, and hardware infrastructure.



30-45 min

Activity

Please take a full 5 minutes to make an exhaustive list of every piece of technology used in your work. If there are enough of you, please break up into groups of 2-3. If there are fewer than 4 participants, do this work individually.

Note that we are using a capacious definition of technology here. The technologies used in your project may include communication tools, local servers, hosting and storage services, as well as any number of applications and platforms.

When complete, regroup (if appropriate), compare notes, and make a final accounting of what constitutes your full technological infrastructure, abiding by the consensus of the group. Spend the rest of your allotted time doing this part of the exercise. It is best to do this work in the Excel spreadsheet template we provide for this module, which asks you to identify:

- Technologies used
- The function of each technology in your project
- The sources and duration of their funding
- The length of time the technology will be needed for your project

You may realize, in the course of doing this work, that you forgot to include someone as an important team member in the previous module (B1), and that's totally fine! Just go over to that worksheet and add them now.

In addition to working from the module spreadsheet, visualizations and mind-mappings are heartily encouraged.

FACILITATING MODULE B3

In this module, project teams will do the work of linking and consolidating the spreadsheets they populated in Modules B1 and B2.

Model a copy-and-paste workflow

To facilitate the work of consolidation, the spreadsheet created for Module B3 has been intentionally designed to allow participants to copy and paste information from the spreadsheets in Modules B1 and B2 directly into this new, third, location. As with the previous modules in this section, we recommend teaching from the website and from the activity itself, carefully walking the participants through the process of merging the information on these spreadsheets.

Match people to technologies

When collating information from the B1 and B2 spreadsheets, we have found that it is easier to assign people to technologies than it is to assign technologies to people. It can be helpful to let participants know that beginning by copying over the list of technologies, and then identifying which agent is responsible for each of them, is often the easiest way to structure this process.

Note any discrepancies between funding sources

In Modules B1 and B2, participants will have mapped out not only the people and technologies upon which

their project depends, but also the funding sources for each. When identifying which people are responsible for tending to specific parts of the project, differences in how they are funded can come into sharper focus. We have found it is effective to remind participants that if a technology and the person who is responsible for it are funded by different sources and/or for different durations, this may be a sustainability red flag—and to remind them, too, that sustainability red flags are simply those things they will want to make a plan for addressing should they ever become an emergent problem as they move forward with their work. Sustainability red flags are not things that can be completely eradicated.

Significant properties matter

Each row of the B2 spreadsheet will list a technology and a person/people/agent responsible for maintaining that technology. It can be helpful to suggest—although it is not required—that the participants rank the technologies from highest to lowest sustainability importance based on how they support the significant properties of the project. This is to say, those hardware, software, and data technologies that underlie those features without which this project simply would not be this project are those which should garner the most attention when planning for ongoing sustainability needs.

Socio-technical responsibility checklist

Now that you have done the work of documenting your project team and their responsibilities, as well as describing the full technological infrastructure of your project, you are prepared to think about how these domains intersect. The previous two modules have alluded to the importance of documenting specific needs and goals for both people and technologies. This is where you get to follow through with that work.

What project elements or accounts are certain people responsible for? Rather than defaulting to the way things are, what is the ideal distribution of responsibilities and permissions across your technological infrastructure? Are the members of your team funded for the same lengths of time that the technologies are funded? If there are gaps, do you know how you will fill them? Are the parts of your project that you identified as significant characteristics in Module A4 securely funded and properly staffed? Does the funding and/or assignment of that team member match the responsibilities being asked of them? Is there a mismatch?

With this information in hand, you may choose to continue distributing responsibilities as you have been, but it is also possible that your work in the previous modules may indicate a more ideal distribution of technologies, responsibilities, and privileges across your project.

For each of the technological resources used in your project, for this module, you will want to determine and document the following:

- What specific technology are you using, and what is its function on the project?
- What member of the project team is responsible for the smooth running of this technology?
- How is that team member funded and for how long on this project?
- How is this particular technology funded and for how long?
- How long is this technology needed on this project?

All of this information was produced in Modules B1 and B2. Your work here in Module B3 is to produce a mapping between them.

As you work, **pay special attention to those technologies that support the significant properties that you identified for your project** in Module A4. When you have completed the mapping, you may wish to highlight those technologies as sustainability priorities.

Access and permissions

For all three areas of infrastructure mentioned above, you may also wish to note how access and permissions are granted to them. As mentioned in the previous module, documenting which team members have access to your various pieces of technological infrastructure is critical to the long-term management of a digital project. This concept will be emphasized yet again in the later Module C4: Permissions & Data Integrity. For collaborative projects that last over several years, staff turnover is not uncommon. Knowing who has access to or control over project content will help significantly in preventing unnecessary data loss. As you are thinking through all of the technologies on your project, it will be helpful to make note of the project team members who have access to them as well as the skills to manipulate them.

Project Name:

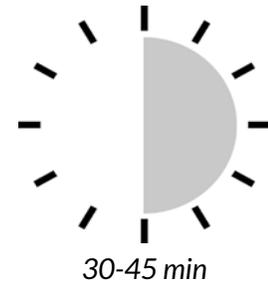
Date:

Section B: Staffing and Technologies

Module B3: Socio-Technical Responsibility Checklist

Overview

In Modules B1 and B2, you documented your project team and their responsibilities as well as the technologies used in the project. In this module, you will be making connections between the lists you made for these previous two modules. This process should provide you with a comprehensive list of technologies used, matched to the team members responsible for working with them.



Activity

As a group, or individually, fill out the Excel spreadsheet provided for this module. While doing this work, please refer to the spreadsheets you created for the two previous modules, and, as a group, identify which technologies are associated with which team members.

Your mapping for this module will include:

- Technologies and their function on the project
- Source and duration of funding for technologies
- Length of time the technology will be needed for your project
- Project team member(s) who are responsible for each technology
- Source and duration of funding for these team members

As you go along, you'll want to consider how the duration of the funding for members of your project team compares with the duration of the funding for technologies they maintain, keeping in mind that funding discrepancies may require special considerations and/or contingency plans to ensure uninterrupted attention.

You should also pay special attention to those technologies that support the significant properties that you identified for your project in Module A4. When you have completed the mapping, highlight those technologies as sustainability priorities in your spreadsheet.

You should be able to copy-and-paste between Excel spreadsheets if you have been using the ones provided by the Roadmap all along. You may also find that you do not incorporate all of the project stakeholders listed in Module B1 into this module's spreadsheet, and that's reasonable if there are team members who are not responsible for working with or maintaining technologies. However, you should be sure to include all of the technologies listed in Module B2 in your work for this module.

SECTION C

Digital Sustainability Plans

MODULE C1

Adapting the NDSA Levels of Preservation *70*

MODULE C2

Access & backing up your work *73*

MODULE C3

File formats & Metadata *77*

MODULE C4

Permissions & data integrity *81*

MODULE C5

Digital sustainability action plan *87*

SECTION C

FACILITATOR'S INTRODUCTION

The expansive, high-level work of Section A combined with the comparably straightforward work of Section B are designed to inform the decisions made throughout Section C, the part of the Roadmap that focuses directly on presenting professional digital preservation practices in ways that digital project teams can both understand and utilize in their ongoing work. Taken together, all three sections contribute to the creation of an actionable sustainability plan, with Section C focusing on the technical practices of preservation most specifically.

As a facilitator, your job in Section C is to bring digital preservation principles to life through stories, context, and wit. This section's work is likely to spark new realizations and questions and these efforts can feel overwhelming even as they help participants begin to focus their sustainability goals. The modules come at the end of much hard work and engaging discussion. They are the most technologically-focused, and demand decision-making and action planning.

In our conversations with project teams, we have found that some assume that “sustainability” is equivalent to “securing funding,” while other assume that “sustainability” is equivalent to “digital preservation.” Neither of these simplifications does justice to the overall complexity of the sustainability process, but funding and digital preservation are both indeed a part of it! The structure of the Roadmap has been designed to ease participants into conversations about the entire scope of sustainability planning. The project-management-focused work of Sections A and B is essential for project teams to get the most value out of the digital preservation conversation in Section C. Taken on its own, Section C would give you a sense of the technical tasks you might need to take on in order to preserve your project, but it does not offer any insight about how these activities would serve your specific goals. For that, teams need to consider Section C in the context of the entire STSR.

When facilitating this module, we have observed that some teams whose projects were in their early planning phases felt that the tasks included in the C modules were too far in the future, and thus less engaging. However, overall feedback from the workshops suggested that the activities were considered valuable by all, even if perhaps more and less practical at different times in the life of a project.

As we remind participants frequently, sustainability work is important and detail-oriented, and the planning inherent to Section C is not always completed by the end of the in-person, facilitated workshop. Often, the convening time—especially the first time through the STSR—can best be spent establishing a shared vocabulary for sustainability conversations that will continue on an ongoing basis after participants have returned to their daily work, perhaps now joined by other members of the project team who could not be present at the workshop. Indeed, we have often found during facilitated workshops that project teams sometimes like to take their time discussing the options outlined in Section C, and defer hard and fast decision-making until a time when they can reconvene with collaborators or stakeholders who are not present.

FACILITATING MODULE C1

Section C begins with an introductory module, “Adapting the NDSA Levels of Preservation,” which is designed to provide both context and framing for the work of the subsequent C modules.

Module C1 is a conceptual introduction and has no activity

Module C1 is somewhat uniquely facilitated within the STSR. Instead of introducing and facilitating a specific structured activity, you are charged with presenting the National Digital Stewardship Alliance’s original Levels of Preservation as well as the ways they have been adapted for the Roadmap. During this module we always take time to acknowledge that, as the creators of the STSR, we were in no way attempting to improve the NDSA’s Levels of Preservation. They were chosen to structure Section C because of their inherent merits—including their specificity and flexibility, and their emphasis on concrete, actionable steps toward sustainability.

By providing this comprehensive introduction to the original NDSA Levels and our adaptations, you will effectively be introducing each of the areas of focus for the activities in Modules C2–C4. As a result, facilitation time for those modules tends to be shorter, consisting of brief introductions to the sustainability actions covered in each, and some common guidance that will help participants as they make decisions about sustainability goals and priorities. Module C1 provides a higher-level overview that lessens the need for direct, content-focused instruction in each of the subsequent C modules.

Sustainability is not the same as preservation

In early iterations of the STSR, we intended to use the original NDSA Levels without modification. As we

tested this with project teams, however, we realized that some modification and reimagining would make them more accessible and applicable to projects that might still be actively developing and changing. What this change of context comes down to, ultimately, is a move from the specific professional needs of archival digital preservation and towards the needs inherent to sustaining one’s own active digital scholarship. When reading the levels, you may begin to think that preservation resembles disaster planning. And in many ways, that’s an accurate assessment. We have come to think of sustainability, however, as being more like project management, encompassing a wide range of activities and relationships that go beyond preservation.

More facilitator interaction with project teams may be required

In Module C1, facilitators are signaling a shift from work that feels like common sense to work that is situated within a specific field and profession and requires new disciplinary learning. While we have made an effort to make this valuable digital preservation guidance accessible to those without formal archival training, the transition from what has been clearly framed as project management in Sections A and B, to something that is disciplinarily embedded in another field (digital preservation) is nonetheless challenging. Because this transition is intellectually difficult, the modules in Section C can require facilitators to check in more frequently with participants to ensure their ongoing engagement with the tasks at hand.

Adapting the NDSA Levels of Preservation

The NDSA Levels of Preservation

The National Digital Stewardship Alliance (NDSA) is a consortium of 165 academic, government, nonprofit, and other organizations committed to preserving and sustaining digital information for long-term access. They provide educational resources and information about digital preservation, which you may find useful as you begin or continue the work of sustaining your digital project, especially if your project has no current plans for eventual retirement.

Developed by the NDSA in 2012, the “Levels of Preservation” are a set of recommendations for enhancing or expanding digital preservation activities within six primary areas of focus: Storage & Geographic Location; File Fixity & Data Integrity; Metadata; File Formats; Information Security; and Access.

We have chosen to work with the NDSA Levels for the Socio-Technical Sustainability Roadmap because they adhere to the highest levels of professionalism and also embody the flexible, customizable spirit of our project in their framing of digital preservation as a process of sustainability. While this framework, like many other available digital preservation models, is designed with archivists or other information professionals as its imagined audience, it outlines concrete steps toward digital sustainability that are, in our estimation, applicable and useful to not only archivists, but a wide range of digital project managers. However, because they were originally tailored for professional stewards and the needs that come with their particular custodial responsibilities, we offer here an adaptation of the NDSA levels focused on the needs of a community of originators, makers, managers, and creators.

The Socio-Technical Sustainability Roadmap adaptation

Since the users of the Roadmap are, in the main, the very same teams responsible for project creation and ongoing maintenance, we have adapted the six areas used in the NDSA’s “Levels of Preservation” framework as follows:

- Access
- Backing Up Your Work
- File Formats
- Metadata
- Permissions
- Data Integrity

We have taken the concepts distributed across the original NDSA Levels and have re-grouped and un-jargoned a few of them, but have made every effort to maintain the integrity and professionalism of the ideas contained within the overall project. By working through these adapted levels, users from outside of the information professions will be presented with an introduction to all of the preservation actions recommended by the NDSA, even if they have no previous experience with or knowledge of digital preservation.

In this way, we hope that our adaptation may also serve as an introduction to the important work done by the NDSA, and as a bridge between digital project managers from various fields and librarians or archivists with professional experience in digital preservation. For those project managers who wish to preserve their work for the extreme long term, we heartily encourage both the use of the original NDSA Levels of Preservation and also consultation and collaboration with professional archivists and data stewards.

Moving through Section C

In the modules that follow, you will be introduced to a series of specific actions that you can take to sustain your digital projects. They are organized as levels, from 1-4. Moving up through each of the levels requires a higher level of commitment from your team at each stage. **Please note! Reaching Level 4 sustainability practices is *not the goal*.** Your work here is to balance what your project needs with the resources (both in terms of technology and staff) that you have.

Moreover, not every project has the same sustainability priorities, as discussed in Module A2. This work is in no way a race to perfection. Indeed, it is absolutely OK for your group to decide that your sustainability goals for some of these areas is actually “Level 0,” meaning that the team will not engage with this particular area of sustainability activity. The point is for this decision to be made mindfully. Knowing what is possible is crucial, but so also is knowing what you are proactively choosing to do with the resources you have.

When assessing which tasks and techniques are right for your project, it will be important to consider the work you have done in Sections A & B. Thinking back specifically to Module A4: What are the project’s sustainability priorities?, you will now be guided through the practical steps that you can take to sustain those parts of your project which you identified as significant.

As you proceed through the following C modules, we recommend printing out the module exercise worksheets found at the top of each webpage for the purposes of tracking your status and taking notes as you work through each of the levels that follow. The module exercises ask you to identify your current and ideal levels in each sustainability area, as well as the resources that will be required for you to move from the former to the latter. These worksheets provide a place for your project team to articulate and evaluate project sustainability goals and progress, and as such, become a valuable form of project documentation.

By the time you reach Module C5, you will be ready to create a sustainability action plan in the form of a spreadsheet that documents not only the sustainability levels you wish to achieve in each area, but also the technological actions you will need to take in order to effectively support that decision.

FACILITATING MODULES C2, C3, & C4

Because Section C is organized a bit differently than the previous sections, our module-level facilitator's advice is also presented differently. The heart of Section C (Modules C2–C4) is an iterative progression through similar activities presented in different contexts, and so we have chosen to consolidate our module—level facilitator's advice for these three modules in one location rather than repeating similar advice multiple times below.

Teach from the website

For Modules C2–C4, we strongly recommend teaching from the website, rather from a slide deck. As you discuss each of the matrices in these modules, take the time to explain key terms and concepts to your participants, and then leave the matrices projected on the screen as they do the work of the activity. If you have provided printed versions of the activities, the teams will also be able to refer to the matrices on paper.

Three years at a time

Here again, it is helpful to remind participants that the goal is not to develop a sustainability plan that will sustain their work “forever.” Even for those who have BookTime as their eventual goal still only need to plan for the next three years, at which time they will revisit their sustainability plans and make any necessary changes or proactively reconfirm their past planning. “Only three years at a time,” is a refrain that facilitators may find themselves—as we did—repeating throughout each of the C modules. You may also wish to remind participants that if BookTime is indeed their goal, the sustainability plan that they produce for the STSR may be something that they wish to use to structure a conversation with a digital preservation professional.

Some digital preservation actions have been integrated into Sections A and B

Be sure to bring it to the attention of the participants that they have already completed a number of digital preservation actions found in Modules C2–C4 simply by virtue of having completed Sections A and B of the Roadmap. For example, looking at the preservation level matrix for “Access” in Module C2, you can show participants that they have already spent time discussing their designated communities and significant properties, and have therefore completed part of the actions required by Level 1. These little reminders connect the work of previous sections to the work of Section C, but just as importantly, they affirm the substantial work that has already been undertaken and serve to make digital preservation planning less abstract and intimidating.

Level 4 is not the goal

As noted in the text of Module C1, it is critical to remember that reaching “Level 4” sustainability practices is absolutely not the goal. The idea is to be very honest about the balance teams wish to strike between the preservation needs that their project requires and the resources—including funding, access to technology and staff—that they have. Not all projects will have the same sustainability priorities, resources, or even longevity concerns, so the responses to the activities in Modules C2–C4 can vary widely!

We also cannot overstate how important it is to note that it is absolutely acceptable for teams to opt for a “Level 0” approach to any of the areas of preservation, if that seems most fitting to their overall goals. This would imply that the team will not engage with this preservation area, but if that is the mindful decision of the group . . . then so be it! Modules C2–C4 offer a universe of possibilities, but only the teams know what they will need to prioritize given the resources they have.

Access & backing up your work

This module addresses the crucial relationship between providing access to your work and its sustainability. The access section addresses the tools and techniques that make your project usable and findable. The section on backing up your work identifies the storage and backup activities required to protect and maintain access to your digital files and information over time.

Access

This section is an adaptation of the Access section of the NDSA Levels of Preservation. Access is a field added more recently to the original five NDSA levels (for more on this addition, see Shira Peltzman's blog post on *The Signal*). While it has not necessarily been adopted by all users of the original guidelines, we feel that it is an utterly essential element to address here, especially for user-facing projects. This table deals with the tools that are available to make your project discoverable and accessible to users—from taking the time to identify designated communities all the way through to proactively providing access to obsolete or difficult-to-access parts of your project.

The activities in Level 2 contain suggestions for working with descriptive metadata, a concept that you will also address in further depth in Module C3. You may also note that, by completing Module A3 of the STSR, you have already accomplished a great deal of the work needed to attain a Level 1 sustainability practice in this area.

Backing up your work

This area, adapted from the original "Storage & Geographic Location," identifies the storage and backup activities required for project team members to maintain intellectual and physical access to digital files and information. Level 1 begins with the basic principle of maintaining more than one copy of your information and keeping those copies in separate storage locations. Maintaining multiple copies in multiple geographic locations is a relatively standard practice for disaster planning in archives and other custodial settings. We advocate this approach for actively developing projects as well, as human factors, such as accidental deletion or loss, pose a significant preservation threat. With only one copy in one location, these risks are exacerbated. Creating and updating distributed copies will dramatically decrease the risk of loss, whether that loss is caused by a spilled cup of coffee or a natural disaster at a larger scale. For more on this approach to file-level sustainability, you may wish to consult the LOCKSS: Lots of Copies Keep Stuff Safe project.

Paying attention to your work in this area is particularly important if your files are stored on lots of heterogeneous media (such as floppy disks, CDs, and flash drives). In this case, it is important to consider consolidating your files as much as possible within a single primary storage system that can then be easily duplicated for the purposes mentioned above. For more explanation of why this is good practice, see Ricky Erway's OCLC publication, "You've Got to Walk Before You Can Run: First Steps for Managing Born-Digital Content Received on Physical Media."

Project Name:

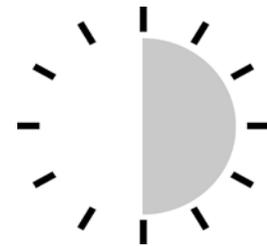
Date:

Section C: Digital Sustainability Plans

Module C2: Access & Backing Up Your Work

Overview

This module addresses the crucial relationship between providing access to your work and its sustainability. The access section addresses the tools and techniques that make your project usable and findable. The section on backing up your work identifies the storage and backup activities required to protect and maintain access to your digital files and information over time.



30-45 min

Activity

As a group (if appropriate), read through the sustainability levels offered by this module and then determine:

- How high a priority this area is for your project
- Your current level of sustainability practices
- Your desired level of sustainability practices (as a goal to be achieved within the next three years)
- The resources and actions that will be required to meet your desired level

Your current level may be a “Level 0” for these areas, and that is absolutely fine. It may even be the case that your *desired* level for a given area is “Level 0.” Keep in mind that very few projects need to be at Level 4, and that this is not necessarily the central goal. Depending upon the specific traits, objectives, and resources of your project, it is likely that you will have different desired levels of effort across many of the sustainability areas presented by the Socio-Technical Sustainability Roadmap. Please focus on choosing your levels of sustainability mindfully and in harmony with your project’s resources and desired longevity.

Project Name:

Date:

Section C: Digital Sustainability Plans

Module C2: Access & Backing Up Your Work

	Level 1	Level 2	Level 3	Level 4
Access	Determine designated communities Create and make available descriptive metadata, such as title, abstract, keywords, or other information that is useful for discovery	Have publicly available documentation, user guides, or other materials that make your work legible to users	Have a publicly available access and use policy	Provide access to the parts of the project that have become obsolete or difficult to access via a native environment and/or emulation

What is your desired level? Why?

0 1 2 3 4

How high a priority is reaching your desired level in this area? Why?

Low Medium High

What is your current level? Why?

0 1 2 3 4

What resources and actions are required to reach your desired level?

Project Name:

Date:

Section C: Digital Sustainability Plans

Module C2: Access & Backing Up Your Work

	Level 1	Level 2	Level 3	Level 4
Backing Up Your Work	Document your reliable sites of project documentation, including a description of their contents Maintain two complete copies, stored separately Reduce to a minimum data stored on heterogeneous types of media (hard drives, flash drives, etc.)	Keep an inventory of storage media and systems used and their technical requirements Maintain three complete copies, with at least one copy in a different geographic location Transfer all data from heterogeneous media (hard drives, flash drives, etc.) to a central storage system	Of the three copies, keep at least one in a geographic location with a different disaster threat Routinely monitor your storage systems and media for obsolescence	Of the three copies, keep at least one in a geographic location with a different disaster threat Routinely monitor your storage systems and media for obsolescence

What is your desired level? Why?

0 1 2 3 4

How high a priority is reaching your desired level in this area? Why?

Low Medium High

What is your current level? Why?

0 1 2 3 4

What resources and actions are required to reach your desired level?

File formats & metadata

The areas addressed by this module focus on creating work in stable, sustainable formats and also making sure that these formats, as well as the rest of your project, are well-documented. The file formats section makes recommendations for creating files in formats that will support long-term access. The metadata section prompts you to think even more broadly about documenting your project, including its socio-technical components and associated workflows.

File formats

While the specifics may vary from project to project, in general, whenever possible, you will benefit from creating digital files in open formats, which tend to better promote long-term accessibility and support. As the levels of this area intensify, recommendations include additional documentation strategies such as creating a master inventory of all file formats used within a project, as well as the work of technological migration and emulation when needed—as might be the case when a project is built in a language or platform that is no longer supported by modern operating systems or browsers. When working through the File Formats section, you should not only consider the formats of individual files, but also the software you will need to render those files, including any original code being used in your work.

Metadata

This section uses a flexible, inclusive definition of metadata, which comprises information about file creation and file locations, as well as descriptive data about your project, including preservation information. Central to this area of sustainability is an understanding of what types of descriptive information is or can be associated with your files and technologies and the assurance that this information will be useful to current and future project team members, or even potential future project stewards.

Recordkeeping and descriptive metadata are included at Level 1, and with each level, additional metadata layers are incorporated. Definitions of each of the types of metadata identified in this section are also available in the STSR glossary. Depending upon the specifics of your project, not every type of metadata is necessary, or even desirable, so this is an area of sustainability in which the levels are not necessarily cumulative. For a more detailed introduction to the world of metadata, project teams may find Jenn Riley's "Understanding Metadata: What is Metadata and What is it For?" helpful.

At Levels 1 and 2, some understanding of open and stable file formats is also required. The Library of Congress Recommended Formats Statement may be useful to teams working to meet the requirements of these first levels. Because open formats are preferred for preservation purposes, no specialized proprietary software is necessarily required.

You may also notice that if you completed the recordkeeping exercises in Module A5, you are well on your way to completing Level 1 in this area of sustainability. Moreover, if your team felt that the Level 2 sustainability practices in Module C2: Access were important to your project, you will also have decided to create and store descriptive metadata, placing the Level 1 sustainability practices directly within reach.

Project Name:

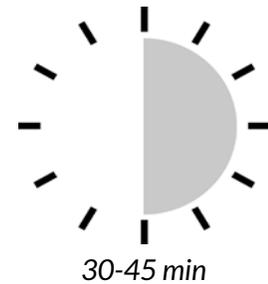
Date:

Section C: Digital Sustainability Plans

Module C3: File Formats & Metadata

Overview

The areas addressed by this module focus on creating work in stable, sustainable formats and also making sure that these formats, as well as the rest of your project, are well-documented. The file formats section makes recommendations for creating files in formats that will support long-term access. The metadata section prompts you to think even more broadly about documenting your project, including its sociotechnical components and associated workflows.



Activity

As a group (if appropriate), read through the sustainability levels offered by this module and then determine:

- How high a priority this area is for your project
- Your current level of sustainability practices
- Your desired level of sustainability practices (as a goal to be achieved within the next three years)
- The resources and actions that will be required to meet your desired level

Your current level may be a “Level 0” for these areas, and that is absolutely fine. It may even be the case that your *desired* level for a given area is “Level 0.” Keep in mind that very few projects need to be at Level 4, and that this is not necessarily the central goal. Depending upon the specific traits, objectives, and resources of your project, it is likely that you will have different desired levels of effort across many of the sustainability areas presented by the Socio-Technical Sustainability Roadmap. Please focus on choosing your levels of sustainability mindfully and in harmony with your project’s resources and desired longevity.

Project Name:

Date:

Section C: Digital Sustainability Plans

Module C3: File Formats & Metadata

	Level 1	Level 2	Level 3	Level 4
File Formats	When possible, create files using a limited set of known open file formats	Maintain an inventory of all file formats used in your project	Routinely monitor your file formats for obsolescence issues	Routinely monitor your file formats for obsolescence issues

What is your desired level? Why?

0 1 2 3 4

How high a priority is reaching your desired level in this area? Why?

Low Medium High

What is your current level? Why?

0 1 2 3 4

What resources and actions are required to reach your desired level?

Project Name:

Date:

Section C: Digital Sustainability Plans

Module C3: File Formats & Metadata

	Level 1	Level 2	Level 3	Level 4
Metadata	Document your reliable sites of project documentation including a description of their contents Create and make available descriptive metadata, such as title, abstract, keywords, or other information that is useful for discovery	Maintain an inventory of all file formats used in your project Maintain an inventory of file sizes for static files	Store administrative metadata, such as when files were created and with what technologies	Store transformative metadata, such as a log of how files have been altered over time Store standard preservation metadata

What is your desired level? Why?

0 1 2 3 4

How high a priority is reaching your desired level in this area? Why?

Low Medium High

What is your current level? Why?

0 1 2 3 4

What resources and actions are required to reach your desired level?

Permissions & data integrity

The activities discussed in this module focus on protecting and maintaining the integrity of your work over time, from the platform level down to the bit level. The permissions section asks you to assess which team members have read, write, and delete authorizations for each technology used. The data integrity section details actions that will help project members ensure that the files they are preserving remain, if desired, fixed or unchanged.

Permissions

This area is primarily dedicated to determining and documenting which team members have access to the technological components of your project and what actions they are allowed to perform. At Level 1, this means identifying who has read, write, and delete permissions for specific files, whereas at Level 4, this means creating and auditing logs of all actions taken on your files in order to closely monitor change and prevent loss. If your project needs and/or uses version control software such as Git or Subversion, you may already be working at Level 3 in this area.

Working through this section, you will find it helpful to refer back to Module B1, where you identified project members and roles, Module B2, where you identified your project's technological infrastructure, and Module B3, where you've made connections between staff and technology. If you've worked through each of those modules, you'll find that you're already in good standing to address the sustainability levels detailed below. Monitoring staff access and permissions is important not only for preventing accidental data losses or changes, but also for preparing for transition planning in the event that a project team changes.

Data integrity

The second area in this module, Data Integrity, focuses on the physical attributes of the digital content itself. The activities in this area are intended to ensure that you are preserving the digital materials you intend to preserve, and that changes to files at the bit level do not go unnoticed.

Straight away, you will certainly notice that the Level 1 behaviors for this area are identical to the Level 1 behaviors for the "Permissions" area above. This is because the first line of defense against data corruption is recognizing that people are capable of making mistakes, and that restricting access to files is not always about trust. It is also about limiting risk. Knowing who has access to perform which actions on which platforms and which files is good project management and is the first, best thing you can do to help protect the integrity of your data.

Level 2 introduces the professional notion of "fixity." Put simply, fixity refers to a digital object's quality of being fixed or unchanged. To create fixity information, you can use a checksum or cryptographic hash. For a more in-depth explanation of fixity, see the NDSA publication "Checking Your Digital Content: What is Fixity and When Should I Be Checking It?"

To learn more about cryptographic hashes, see this post by Bill LeFurgy from the Library of Congress's blog, *The Signal*, "Hashing Out Digital Trust." Some off-the-shelf content management systems, such as CollectiveAccess, create checksum information upon ingesting digital files, so do check in with your system documentation to find out if you are already performing this activity.

However, simply creating fixity information will not be enough to actually offer you sustaining help should something go wrong—knowing that a file has been corrupted will not do much good without being able to repair the issue. For this reason Level 2 also indicates that you must also be able to replace corrupted information when you find out that there is a problem. To assure yourself that this would be possible, please refer back to your work in Module C2, specifically in the section on *Backing Up Your Work*. Will you have sufficient copies, and access to those copies, to repair any corrupted files?

It is particularly important in this area to remember that each of these levels may not be applicable to every project. Fixity information is likely to be more valuable in some projects than in others: namely, it may not be very meaningful to check and regularly update the fixity information of files that are being actively developed or altered because it is in the nature of such information to keep changing over time. On the other hand, if your project is centered on a curated collection of stable digital images, the fixity information of those files may be mission-critical. Keep this in mind as you consider your ideal level in this area.

Project Name:

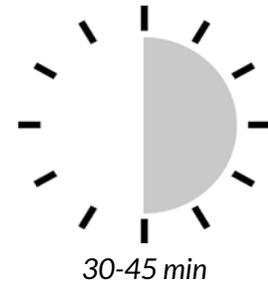
Date:

Section C: Digital Sustainability Plans

Module C4: Permissions & Data Integrity

Overview

The activities discussed in this module focus on protecting and maintaining the integrity of your work over time, from the platform level down to the bit level. The permissions section asks you to assess which team members have read, write, and delete authorizations for each technology used. The data integrity section details actions that will help project members ensure that the files they are preserving remain, if desired, fixed or unchanged.



Activity

As a group (if appropriate), read through the sustainability levels offered by this module and then determine:

- How high a priority this area is for your project
- Your current level of sustainability practices
- Your desired level of sustainability practices (as a goal to be achieved within the next three years)
- The resources and actions that will be required to meet your desired level

Your current level may be a “Level 0” for these areas, and that is absolutely fine. It may even be the case that your *desired* level for a given area is “Level 0.” Keep in mind that very few projects need to be at Level 4, and that this is not necessarily the central goal. Depending upon the specific traits, objectives, and resources of your project, it is likely that you will have different desired levels of effort across many of the sustainability areas presented by the Socio-Technical Sustainability Roadmap. Please focus on choosing your levels of sustainability mindfully and in harmony with your project’s resources and desired longevity.

Project Name:

Date:

Section C: Digital Sustainability Plans

Module C4: Permissions & Data Integrity

	Level 1	Level 2	Level 3	Level 4
Permissions	Identify which project members have login credentials to accounts and services used Identify which project members have read, write, move, and delete authorization to individual files	Restrict authorizations to only necessary team members Document access restrictions for services and files	Maintain logs of who performs what actions on files, including deletions and preservation actions	Perform routine audits of activity logs

What is your desired level? Why?

0 1 2 3 4

How high a priority is reaching your desired level in this area? Why?

Low Medium High

What is your current level? Why?

0 1 2 3 4

What resources and actions are required to reach your desired level?

Project Name:

Date:

Section C: Digital Sustainability Plans

Module C4: Permissions & Data Integrity

	Level 1	Level 2	Level 3	Level 4
Data Integrity	Identify which project members have login credentials to accounts and services used Identify which project members have read, write, move, and delete authorization to individual files	Be able to replace/repair corrupted data Create fixity information for stable project files	Check fixity of stable content at fixed intervals	Check fixity of stable content in response to specific events or activities

What is your desired level? Why?

0 1 2 3 4

How high a priority is reaching your desired level in this area? Why?

Low Medium High

What is your current level? Why?

0 1 2 3 4

What resources and actions are required to reach your desired level?

FACILITATING MODULE C5

As the final module of the Roadmap, C5 can feel like the finish line after a difficult but inspiring race. The activity for this module is a “Digital Sustainability Plan Checklist” that consolidates a great deal of information from Sections A, B, and C.

Teach from the spreadsheet

As with Modules B2 and B3, we have found it to be effective to teach the consolidation work of Module C5 by downloading and projecting the spreadsheet onto a shared screen. All six of the preservation areas are listed down the left-hand side, and the teams are encouraged to fill each section out as completely as they can with the information that they have gathered together in the workshop. As noted below, they may not be able to fully finish this work in the time allotted but do remind participants that this is OK.

Teams may wish to contact those not present

We have also found that this module is a time when project teams can usefully “call a friend,” and use Zoom or FaceTime or some other mode of telecommunication to talk to team members who could not be there with them in person. The information required by the C5 module is not complicated, but sometimes only “that one team member” has access to it.

This module may take the shape of documentation consolidation

Because the work of the preceding C modules is shaped by each project’s specific priorities, phase of development, and expertise of team members present at the workshop, this final module will necessarily vary from one project to another. In some instances, this will look like the documentation consolidations that took place in Module A5. Teams may find it most beneficial to use this working session to revisit previous conversations, organize the documentation they have produced, or begin planning work that will take place following this working session. While this work may not follow the exact outline of Module C5, all of it is useful and reflects engagement with the Roadmap.

The end of the Roadmap is not the end of the work of sustainability

Sustainability is an ongoing process. In our experience, some project teams leave Module C5 with a clear action plan, but many more leave with a long to-do list to be addressed when they are back at their home institutions and can speak with their complete project teams. Both of these outcomes, or any that may fall in between, are successes. It can feel supportive to remind participants of this, and to encourage them to use Module C5 as an opportunity to regroup, to consolidate the work of previous modules (A, B, and/or C), and to document next steps that they will want to take. Whether they leave the workshop “finished” with Section C or not, documentation of their work from each module of the workshop will be invaluable.

Digital sustainability action plan

This module builds on and brings together the work you have done up to this point, helping you to compile focused documentation of your resources and your plans for ongoing digital sustainability. Here, you will do the work of creating a detailed, actionable sustainability plan using the adapted NDSA Levels of Preservation as a guiding structure.

Using the downloadable Excel spreadsheet found above, if you like, identify the following pieces of information for each of the six sustainability areas introduced in Modules C2-C4:

- Your chosen level of sustainability and the rationale for your decision
- The anticipated time frame for attaining that sustainability level
- A catalog of individual actions you will take to reach your chosen level
- Specific team members who will be responsible for each of these sustainability actions
- A time frame for completion of each action (this should be fewer than three years)

It is worth noting that when you construct your catalog of sustainability actions, you should be aiming for tasks that are achievable within the next three years—that is, in the period before you run the STSR again, or your project reaches retirement, whichever comes first. The point of this exercise is to develop an ongoing relationship with sustainability practices that will last for as long as you would like your project to last.

Once you have completed this work, make sure that you store the documentation for this, and all other, STSR modules in one of your reliable sites of project documentation! Your current and future project team members will thank you.

Also, remember that as you proceed with your project over time, the information contained within this worksheet may change, even before your next STSR check-in. As staffing, technologies, or other factors change, you can update or add to your sustainability action plan as you see fit.

Project Name:

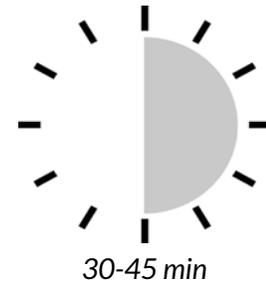
Date:

Section C: Digital Sustainability Plans

Module C5: Digital Sustainability Action Plan

Overview

In Section A: Project Survey and Section B: Staffing and Technologies, you identified your project's scope, sustainability goals, and available staff and technologies. In the previous C modules, you have been introduced to a series of professional-grade sustainability actions based on the NDSA Levels of Preservation. In this module, you'll connect your work in Section C to your work from Sections A and B in order to create a concrete plan for taking steps toward sustaining your digital project for as long as you wish it to last.



Activity

As a group (if appropriate), work through the Excel spreadsheet provided for this module. Please refer to the spreadsheets you created for Modules A5 and B3, as well as the worksheets you completed for each of the sustainability areas introduced in Modules C2, C3, and C4. Even if you do not wish to use the provided spreadsheet, please detail the following pieces of information for each of the six sustainability areas detailed in the STSR:

- Your chosen level of sustainability for that area and the rationale for your decision
- The anticipated time frame for attaining that sustainability level
- A catalog of individual actions you will take to reach your chosen level
- Specific team members who will be responsible for each of these sustainability actions (remember to ensure their availability)
- A time frame for completion of each action (should be fewer than three years)

It is worth noting that when you construct your catalog of sustainability actions, you should be aiming for tasks that are achievable within the next three years—that is, in the period before you run the STSR again, or your project reaches retirement, whichever comes first. The point of this exercise is to develop an ongoing relationship with sustainability practices that will last for as long as you would like your project to last.

Once you have completed this work, make sure that you store the documentation for this, and all other, STSR modules in one of your reliable sites of project documentation! Your current and future project team members will thank you.

Also, remember that as you proceed with your project over time, the information contained within this worksheet may change, even before your next STSR check-in. As staffing, technologies, or other factors change, you can update or add to your sustainability plan checklist as you see fit.

POST-SECTION C

PROMPTS FOR GROUP REFLECTION

We have traditionally focused on a moment of group conversation at the end of Section A and then again at the end of the entire workshop. The work of Section B, as discussed previously in this manual, is highly structured and pragmatic. Teams are undertaking specific processes for documenting the dependencies of their projects. In our experience, we have not found it necessary to run sessions for group reflection after Section B, although your approach may differ and we encourage you to consider adding one.

No matter how you decide to facilitate group reflection practices prior to this moment, once the teams have made it to the finish line, they often relish the chance to reflect on all that they have accomplished. Beginning with Section A's focus on project management, continuing through to Section B's work on staffing and technology dependencies, and then finally isolating their particular digital preservation concerns in Section C, the roadmap can seem like a fruitful conversation that deserves mindful consideration.

Structurally, we organize the group reflection session at the end of Section C similarly to the group reflection that we plan at the end of Section A. We place large post-its on the wall, but direct everyone's attention to one another. At this culminating point in the workshop, we ask two new questions:

What is digital sustainability?

What are "sustainability red flags?"

Whether you are facilitating this workshop for multiple project teams or are focused on your own, this final group reflection gives participants yet another opportunity to learn from one another. It can demonstrate the expansiveness of the process of digital sustainability and offer a time to realize how much the participants have learned. It can also reassure project teams that their sustainability red flags are shared by others and that there are actions that we can take to ensure that our work will last for as long as we want it to last.

For facilitators, this is also an excellent final opportunity to remind participants that all projects have sustainability red flags—there is no such thing as a project without them. The goal is not to eradicate all dangers, but instead to identify as many of them as possible and to make thoughtful, informed decisions about how to respond when issues arise, as they always will. Sustainability is the ongoing work of caring for and maintaining the things that are important to us as we create new knowledge and connections between human beings.

OLD SMALL GROUP PRACTITIONER
COBBLING TOGETHER MONEY GRANT FUNDING
DIGITALLY PROJECT
INTERNATIONAL COLLABORATIONS
MAPPING INTERDISCIPLINARY HISTORY
PUBLIC-IMAGES COLLABORATIVES
FACING PROTECT TEAM TURNOVER
WEBSITES LINGUISTICS ORAL HISTORIES INTERGENERATIONAL RESEARCH
MEDIA ARCHIVED
STUDENT LABOR
PRIVACY & ETHICAL CONCERNS
RECREATING CONVERSATIONS
RECONCILIATION PROCESS
CROWD-SOURCING ACCESS TO RECORDS
PUBLIC CONTRIBUTIONS
BLOGS DIGITIZATION
VOICES OF WOMEN OF COLOR
PRODUCING A COMMUNITY
LINKED PROACTIVELY
DATA THINKING ABOUT SUSTAINABILITY
TEACHING DATA SELF
DIGITIZING @ NAB
USING OTHER COUNTRIES
DIGITIZATION
PHOTO-PROCESS
THEQUE
DIGITIZATION
700,000 OBJECTS
COMPUTER USAGE
VARIABLE JUST SUPPORT!!

GOODBYE . . . SO LONG AND GOOD LUCK!

When the Socio-Technical Sustainability Roadmap was originally developed for the “Sustaining MedArt” project in 2018, we designed it to be a self-guided workshop, and it can certainly function well in that format. However, early on in the course of testing the Roadmap with real project teams, we learned that the participants not only found in-person facilitation to be highly beneficial—they felt that it was crucial for maintaining focus and attention and almost essential for giving the teams a clearly recognizable, extrinsic reason to clear their schedules to do this type of fundamentally important project management work. This finding led to our decision to propose a facilitated workshop series for project teams across the United States, and the 2019 Sustaining DH workshop series was the result of our efforts. We learned a great deal more about digital sustainability practices—as well as the shape of the digital humanities in the US—during that period.

In reflecting on this work, we clearly recognized that it would simply not be sustainable or ethical for our original project team to be the only group capable of facilitating STSR workshops on an ongoing basis. Our vision from the start has been to provide resources, like the original website, that others could use within their own communities to support and care for their digital project work. It is our hope that this manual, which shares the insights we have gained as in-person workshop facilitators, will help make that vision an even stronger reality.

Both the Socio-Technical Sustainability Roadmap itself and this manual are made freely available to our users under a CC BY-NC 4.0 license. You may remix, reuse, and reimagine this workshop as you please—and we hope that you will. Go out and make this workshop your own, and make the digital world a more sustainable, and sustained, place!

Glossary

Archive Information Package (AIP)

An information package consisting of the Content Information and the associated Preservation Description Information (PDI), which is preserved within an OAIS.

checksum

A hash function that is commonly used to detect errors in files and compare multiple versions of files to detect changes. To learn more, see this post from The Signal.

codec

A device or program that compresses data to enable faster transmission and decompresses received data.

containerization

A form of virtualization in which an application and all required software, libraries, and associated files are packaged together in a single computing environment.

creative outputs

Larger-scale digital projects are often multi-faceted, containing any number of different creative outputs, such as websites, datasets, exhibitions, software, or written publications. Each of these can be usefully considered as “sites of production” within a project, especially in the context of project recordkeeping.

designated community

Users, imagined or identified; this term is used in the OAIS.

Dissemination Information Package (DIP)

An information package derived from one or more AIPs, received in response to a request to the OAIS.

emulation

A technique used to overcome the technical obsolescence of hardware and software by imitating obsolete systems on later generations of computers.

fixity

A term used to indicate that a file has not been accidentally or purposefully changed.

hash

A hash function transforms a string of characters into another (usually shorter) string of characters (a hash value). To learn more, see this post from The Signal.

metadata

An information package consisting of the Content Information and the associated Preservation Description Information (PDI), which is preserved within an OAIS.

administrative: Metadata that provides information needed to manage a resource, such as when and how it was created, file type, and access privileges.

descriptive: Metadata that describes a resource for purposes such as discovery and identification. It can include elements such as title, abstract, author, and keywords.

preservation: Metadata that documents and supports the digital preservation process. PREMIS has become the de facto standard for preservation metadata.

technical: Metadata that describes the technical processes used to produce, or required to use a digital object.

transformative: Metadata that shows how attributes of a digital object have changed from the object's origins to its current or final form.

use: Metadata that documents user access, user tracking and versioning information.

migration

A strategy used to overcome technological obsolescence by transferring digital resources from one generation of hardware or software to the next. The purpose of migration is to preserve the intellectual content of digital objects within modern systems, supporting the retrieval and access of content.

open archival information system (oais)

A conceptual framework for an archival system dedicated to preserving and maintaining access to digital information over the long term. Its purpose is "to increase awareness and understanding of concepts relevant for archiving digital objects, especially among nonarchival institutions; elucidate terminology and concepts for describing and comparing data models and archival architectures; expand consensus on the elements and processes endemic to digital information preservation and access; and create a framework to guide the identification and development of standards." For more information, see OCLC's guide.

open format

A file format that can be used and implemented by anyone with no monetary restrictions; in contrast with a closed format, which can be a trade secret. These are considered more accessible and sustainable, as they can be opened and read correctly with a range of software products. The structure of an open format is often set out in agreed standards, overseen and published by a non-commercial expert body.

optical media

Discs that are read by a laser, including CD-ROMs, DVD-ROMs, and all variations of these two formats. [reliable site of project documentation](#)

A storage location—whether physical or digital—that all project team members agree are communally-kept and community-essential. Project documentation is consistently stored and accessed here.

site of production

An individual facet or creative output of your work. Taken together, these comprise your project.

submission Information Package (sIP)

An information package that is delivered to the OAIS for use in the construction or update of one or more Archival Information Packages (AIPs).

sustainable format

A file format that enables access regardless of the specific technologies used to create the file. Sustainable formats increase the likelihood that a record will be accessible in the long term.

write-blocker

A device that allows for the acquisition of information on a drive without allowing for accidental damage to or deletion of the drive's contents. This is accomplished by allowing only read commands, and preventing (or "blocking") write commands.

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