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Workshop Report

Digitization Coordination Workshop Report

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Abstract

Many larger museums and archives have begun to implement a centralized approach to digitization of collections by creating Digitization Coordinator positions. This new effort has initiated a singular vision for digitization that incorporates priorities, workflows, and resources to greatly improve the efficiency and throughput of digitization in collections. Smaller institutions are now starting to see the benefit of creating a more structured cross-

disciplinary approach to digitization, allowing for better awareness and resourcing of digitization needs.

The workshop brought together natural sciences digitization professionals from the USA and EU, highlighting lessons learned and best practices to realize the benefits of a coordinated approach including advocacy for digitization, accelerating digitization efficiency and, ultimately, increasing digital collections access and usability to address societal challenges, such as biodiversity decline. Insights, lessons learned and initial thoughts on best practices are described, and the supporting workshop resources are shared so that others can benefit.

Keywords

Digitization, coordination, communities of practice, best practices, documentation, advocacy, staffing, infrastructure, digitization prioritization, funding, culture, management, shared resources, project management, program management

Date and place

This workshop was held at the Smithsonian National Museum of Natural History, Washington DC, on 2–4 May 2023.

Day 1: Tuesday, May 2 - Digitization coordination strategies in natural history institutions.

Day 2: Wednesday, May 3 - Project management and strategy, in addition to topics of coordination and leadership.

Day 3: Thursday, May 4 - Start-up tips for a digitization coordinator; future plans for creation of a Digitization Coordination Network.

List of participants

Workshop participants included those working with established natural history collections with digitization programs and represented a range of experience with digitization coordination. Most participants were from institutions in the United States with some European institutions represented as well. See Table 1 for full list of participant names and their presentations, as well as Fig. 1 for a photograph of the group.

Introduction

Many larger museums and archives, such as the Smithsonian's National Museum of Natural History, Smithsonian's Libraries and Archives, The Natural History Museum London and the Museum für Naturkunde, Berlin have begun to implement a centralized approach to collections digitization by creating Digitization Coordinator or Program Manager

positions. This new effort has initiated a singular vision for digitization that incorporates priorities, workflows and resources to greatly improve the efficiency and throughput of digitization in collections; and to bring wider benefits such as clear advocacy for digitization, understanding of impact and improved career paths for digitization professionals.

Table 1.

List of participants (in alphabetical order) in the workshop, including affiliation and country. Presentations are all available at the Zenodo Digitization Coordinator Network community.

	Participant name	Affiliation	Country	Workshop Presentation
1	Frederik Berger	Museum für Naturkunde	Germany	Berger and Schuster (2024)
2	Emily Braker	University of Colorado Museum of Natural History / Arctos	USA	Braker (2024a) and Braker (2024b)
3	Jacqueline Chapman	Smithsonian Libraries and Archives	USA	n/a
4	Lauren Cohen	University of Florida, Florida Museum, iDigBio	USA	n/a
5	Jillian Goodwin	University of Florida, Florida Museum, iDigBio	USA	n/a
6	Sharon Grant	Field Museum	USA	Grant (2024)
7	Jesse Grosso	University of Florida, Florida Museum, iDigBio	USA	n/a
8	Helen Hardy	Natural History Museum, London	UK	Hardy and Livermore (2024) and Livermore and Hardy (2024)
9	David Jennings	University of Florida, Florida Museum, iDigBio	USA	Jennings (2024)
10	Holly Little	National Museum of Natural History, Smithsonian Institution	USA	n/a
11	Laurence Livermore	Natural History Museum, London	UK	Livermore and Hardy (2024) and Hardy and Livermore (2024)
12	Austin Mast	Florida State University, iDigBio	USA	Mast (2024)
13	Gary Motz	Indiana University	USA	Motz (2024)
14	Gil Nelson	University of Florida, Florida Museum, iDigBio	USA	n/a
15	Sylvia Orli	National Museum of Natural History, Smithsonian Institution	USA	Orli (2024)

	Participant name	Affiliation	Country	Workshop Presentation
16	Nelson Rios	Yale Peabody Museum	USA	Rios and Sweeney (2024)
17	Vincent Rossi	Smithsonian Digitization Program Office	USA	n/a
18	Franziska Schuster	Museum für Naturkunde	Germany	Berger and Schuster (2024)
19	Rebecca Snyder	National Museum of Natural History, Smithsonian Institution	USA	n/a
20	Kira Sobers	Smithsonian Libraries and Archives	USA	Sobers (2024)
21	Patrick Sweeney	Yale Peabody Museum	USA	Rios and Sweeney (2024)
22	Kimberly Watson	New York Botanical Garden	USA	Watson et al. (2024)
23	Alyson Wilkins	Natural History Museum of Utah	USA	Wilkins (2024)
24	Jen Zaspel	Milwaukee Public Museum	USA	Zaspel et al. (2024)
25	Breda Zimkus	Harvard University	USA	Zimkus and Schmull (2024)
26	Diane Zorich	Smithsonian Digitization Program Office	USA	Zorich (2024)

Figure 1. doi

Photograph of the workshop participants at the Smithsonian National Museum of Natural History taken by Mary Behlke - Smithsonian National Museum of Natural History.

Smaller institutions, such as the Natural History Museum of Utah, are now starting to see the benefit of creating a more structured cross-disciplinary approach to digitization, allowing for better awareness and resourcing of the digitization needs in the museum. After a popular symposium at BioDigiCon2022, it became evident that collections throughout the US are looking for ways to improve the efficiency, access and usability of their collections.

To expand on the interest in the topic, this 2023 Digitization Coordination workshop was designed to bring additional institutions together with the hope of creating best practice documents to guide institutions, faculty and staff in organizing a unified digitization approach and vision within their institution. Once together in person, it became evident that more was needed for this effort to be successful. Cultural changes within institutions and between institutions require leadership to help provide the community with holistic views of what has been accomplished to date and plans for future digitization efforts.

Aims of the workshop

The aim of the workshop and its follow-up activities are to encourage the adoption of digitization coordination roles and practices; to increase the efficiency and resource sharing of digitization coordination across institutions; and to enable better communication and support between digitization coordination practitioners.

The workshop provided an opportunity to share different organizational perspectives and to discuss a range of practical topics, followed by a synthesis of these into a collection of informally and formally published resources.

Key outcomes and discussions

Day 1 - Outline

The first day of the workshop was dedicated to presentations from natural history professionals highlighting digitization coordination. Presenters were asked to give their perspective on what digitization coordination currently looks like within their institution, including: importance of digitization; how digitization plans/priorities are established; how coordination works; what strategies are used to coordinate efforts to be cross-functional and break silos; what investment and leadership buy-in looks like; strategies for advocating digitization to leadership; challenges for coordination; promoting digitization for discovery; and benefits of coordination at a global level.

Presentations were given by:

- Smithsonian Institution – National Museum of Natural History (NMNH)

- Smithsonian Institution – Digitization Program Office (DPO)

- Smithsonian Institution – Libraries and Archives (SLA)

- The Natural History Museum, London (NHM)

- Museum für Naturkunde (MfN)

- Natural History Museum of Utah (UMNH)

- Milwaukee Public Museum (MPM)

- University of Colorado Museum of Natural History (UCM)

- Indiana University (IU)

- Yale Peabody Museum (YPM)

- Museum of Comparative Zoology and Harvard University Herbaria (MCZ and HUH)

- Field Museum (F)

- New York Botanical Garden (NYBG).

At the end of the day, workshop participants were asked to record on sticky notes the topics, common challenges and other patterns they observed throughout the institutional overview presentations. The sticky notes were grouped into priority areas for workshop participants to address:

- **Advocacy** - including how coordination can underpin measures and metrics of impact, case studies and stories and how to use these effectively with different internal and external audiences.
- **Culture** - including coordinated working across silos and boundaries, setting up and managing cross-functional teams for project and program delivery, the use of program and project management techniques, creatively working within constraints and developing common language.
- **Infrastructure** - including data mobilization, preservation and standards, challenges with marketing and promoting infrastructure and the differences in perception between infrastructure and systems as 'plumbing'/enablers and the concept of collections data as a distributed research infrastructure.
- **People** - including different staffing models (permanent, fixed term, interns, students, volunteers, outsourcing etc.), retention and motivation, how digitization coordination can help with professionalizing digitization career paths and recruitment.
- **Prioritization** - including the variety of drivers for this, the need for innovation projects, how coordination helps strike the balance between flexibility and focus, the need to be data-driven and the strong relationship to funding opportunities.
- **Shared resources** - the existing and new resources that could be shared for the benefit of the community.

Discussion reflected the fact that these topics are closely interlinked, with key factors including, in particular, the provision of funding and resources that cut across all of them.

Day 2 - Outline

The morning of the second day was dedicated to presentations on project management and strategy, in addition to topics of coordination and leadership. Two global projects, Arctos and DiSSCo, were also discussed as examples of multi-institution coordination.

- Workforce Development and Strategic Planning

- Project Management, Coordination and Leadership

- Arctos

- DiSSCo

The afternoon began the important group discussions of digitization coordination. Following the identification of the priority areas on Day 1, the group worked to further refine the topics and define aspects to address with additional workshop activities or in the workshop deliverables. Four of the topics (Advocacy, People, Infrastructure and Prioritization) were addressed in breakout groups with a prompt to create a one sentence summary of the group's assigned topic, define the key elements and to identify relevant roles and stakeholders. The additional priority topics highlighted on Day 1 were either addressed across the breakout groups or planned through additional workshop activities and discussion (e.g. an action plan for networking and shared resources).

Key insights from the breakout groups are summarized below.

Group 1 - Advocacy

Summary statement: In order to advocate effectively, find a way to connect your collections to the "common ground" that people will relate to.

The group discussed key elements:

- Starting with a high-level impact message about 'why' that translates to everyone;

- Organizing to maximize the impact of that 'why' through digitization coordination;

- Combining stories and data at the more detailed level focused on each audience or stakeholder.

The group identified that everyone involved can be an advocate for collections and digitization if given the tools. They emphasized that it is important to recognize the challenges, such as whether digitization inadvertently implies that physical collections are no longer needed and to prepare positive talking points for these issues. The group also discussed some of the key areas of 'why' messages, such as the global challenges that collections data help to address.

Group 2 - People (management and staffing)

Summary statement: We recommend a single institution-wide digitization coordinator/ program manager who is empowered and has senior stakeholder support.

The group discussed key elements in coordinator responsibilities:

- Development and implementation of the appropriate staffing and resourcing model (e.g. roles, mode of collaboration, training, professional development);

- Fostering digitization innovation and discovery;

- Communicating and advocating across the organization (i.e. breaking down silos) as well as externally (e.g. understanding community standards, best practices).

Group 3 - Infrastructure

Summary statement: Digitization infrastructure requires integration and interoperability/ coordination of systems, people, policies and best practices to implement and enable the data lifecycle and realize the Digital Extended Specimen.

The key elements feeding into this were identified as:

- Cyber infrastructure (devices, networks, integration, interoperability, humans);

- Policy (data asset management, FAIR principles, sustainable digital infrastructure, rules etc.);

- Management (people/governance);

- Best practices (data lifecycle).

Group 4 - Prioritization

Summary statement: Perfection is the enemy of progress.

The group noted the need for goals to be developed and shared and to take into account multiple drivers including funding, collections strengths and stakeholder needs. Key elements discussed:

- Community development is predicated on understanding your stakeholder landscape and the (institution-specific) hierarchy that it sits within;

- Prioritization is influenced by strategic plans; laws & community expectations; infrastructure and sources of funding - it needs to be both flexible and adherent to a foundation;

- Clever decision-making can create a prioritized task list that levels the playing field for different stakeholders (through a balanced approach).

Day 3 - Outline

The final day began with a discussion of start-up tips for a hypothetical newly-hired digitization coordinator. Workshop participants were divided again into four groups, with the task of creating five tips for this position.

Common tips included:

- Build understanding of stakeholders, collections and infrastructure, ideally through tours or hands-on experiences/work;

- Understand needs - how you can help various stakeholders meet their needs, which needs are urgent etc.;

- Identify allies/supporters/advocates, both locally and by reaching out to the wider community and resources;

- Give early consideration to measures and metrics - start early to build data and understand these may evolve;

- Be proactive in working with leadership to define the coordination role - what is your mandate and scope and within your power to do or influence? Who are your team and what is your capacity to build a team? Be clear that digitization coordination is a change management role, not just a data production one;

- Develop your plan, but also start to act and communicate about those actions to generate positive impact;

- Be aware of tools and approaches (e.g. in project and program management), but adapt them to your context - they work for you not the other way round;

- Find a balance between focus and flexibility.

The workshop then moved to the discussion of next steps and action planning.

Key Outcomes and Discussion

As summarized above, we identified that the digitization coordination role and function is key across critical topics and work areas. The four priority topics identified and discussed on Day 2 that are likely to be a focus of future work for the group are:

1. **Advocacy** - In order to advocate effectively, we must find a way to connect our collections to the "common ground" to which people will relate. Advocacy should stay positive, but respond to the challenges of digitizing. Advocacy needs to respond to audiences - from local leadership to various types of funders, government and the public. Tools can include evidence of impact, cost effectiveness and economic benefit; strategic planning; a shared grand vision; and case studies of projects and their uses and impact;

2. **Staffing** - We recommend a single institution-wide digitization coordinator/program manager who is empowered and has senior stakeholder support. As discussed by many Day 1 presentations, this scenario creates the best potential for an effective digitization program. The digitization coordinator fosters innovation and discovery, communicates, advocates broadly across their organization as well as externally and implements an appropriate staffing and resourcing model. Where scale of team permits, digitization coordination also helps to professionalize career paths in digitization, linking these to wider leadership and project/program management skills and supporting staff development and retention.

3. **Infrastructure** - Digitization must be understood as including the full lifecycle of data mobilization, not just the creation of data and images on a local system. This requires integrated approaches including community data standards and systems that can interoperate - there are significant implications, for example, for collections management systems. Infrastructure can be challenging in many ways - particularly in relation to securing skilled resources. The 'plumbing' aspects of infrastructure can be hard to 'sell' as a story or funding prospect. On the other hand, the concept of collections data as a critical distributed research infrastructure nationally and globally to address key planetary challenges can be very powerful.

4. **Prioritization** – There are numerous factors that influence digitization prioritization - those mentioned throughout the course of the workshop include strategic factors (e.g. collections strengths and uniqueness, research relevance, cultural or engagement relevance, education relevance); audience and stakeholder factors (e.g. the needs of communities of origin, needs of key partners such as the Biodiversity Heritage Library, and other demand-led approaches); organizational factors (e.g. organizational strategy and goals, collections moves or particular collections risks); feasibility and practical factors (e.g. collections readiness, workflow readiness for object types, cost effectiveness); and cutting across all of these the key driver of funding and resources. In order to respond to these needs and opportunities, digitization coordinators must manage prioritization in a way that balances flexibility. For example, to respond to new funding opportunities or to events, such as the global pandemic, while adhering to a documented approach or principles, so that it remains strategic and efficient, rather than wholly reactive or 'cherry picking'.

These topics cover some of the most challenging areas that a digitization coordinator must navigate within their institutions, often with limited resources. By creating shared resources and establishing a community, we can better support each other and share experiences and first-hand knowledge that would otherwise be hard to obtain. While digitization coordinators are likely to be the main audience of our future resources and publications, we recognize that we need to talk beyond our immediate community and there are relevant crossovers beyond natural history collections in libraries, archives and other repositories.

While we advocate for a dedicated digitization coordinator, we recognize that there are many ways digitization coordination can happen within institutions and across countries.

There are likely to be different funding models, support within an institution and valuation of digitization as an institutional strategy.

Finally, our resources should be relevant to other museum roles that are directly involved with or support digitization, such as curators, collection staff, other scientific personnel, informatics and IT staff and directors. At a national and international level, our broader community needs to work with funding bodies, including national scientific research foundations/councils and demonstrate the impact of our digitization work to relevant policy-makers.

Conclusions

Throughout the workshop it became evident that more was needed beyond a general best practices' document. Coordination of digitization efforts within natural history collections is multifaceted with many different stakeholders. Collaborations between different collection-holding institutions, with broader geographic representation and collaboration with other community organizations would only strengthen the impact and sharing of knowledge. Participants agreed that a community network focused on information and resource sharing amongst people working in digitization coordinator roles or associated efforts was needed. The group set goals to create a "Digitization Coordinator Network" (DigiCoordNet) to help address these needs in the community. The DigiCoord network would utilize a space in GitHub for centralizing information and use Slack as a communication platform. Workshop activities will also be summarized into a series of publications and presentations, providing entry points, education and outreach to different stakeholder groups.

To view workshop presentations and details, go to the workshop Wiki page.

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Hosting institution

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Conflicts of interest

The authors have declared that no competing interests exist.

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