

**Handover Plan**

Museum of Vertebrate Zoology

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This handover plan outlines the following: specific deliverables to be handed over from the UC Davis MSBA Practicum team to the Museum of Vertebrate Zoology / Arctos Consortium, the form each deliverable will be provided in, a timeline for each deliverable, the intended recipient of each deliverable, and the intended impact of the deliverable.

### Specifics of Final Deliverables and Processes

Based on discussions with the MIP and the Statement of Work, there are 4 major deliverables the team will hand over. Below is a list of the deliverables with an explanation of each deliverable.

1. **Tableau Dashboard**: A dynamic, user-friendly dashboard summarizing key Arctos usage metrics (e.g., institution contributions, number of records, taxon records, counts of research and media). The dashboard consists of a bar chart that displays the number of records from each institution, a pie chart that displays the percentage of contributions from each institution, and bar charts displaying system statistics. The dashboard also includes spatial analysis in the form of an interactive map that shows record count, record type, and year collected.
2. **AI-Powered Chatbot**: Two different assistive chatbots were developed to help Arctos users generate search queries from natural language. The first chatbot is a custom GPT-based assistant prototype built using OpenAI ChatGPT platform and integrated with Arctos documentation to help users construct Arctos search query URLs. It is prompt-based, lightweight, and easy to update with new documentation or improved prompting strategies. The second, and the primary chatbot is a Streamlit web application that connects the OpenAI API (GPT-3.5) with the Arctos database API. It parses natural language queries into structured parameters (e.g., taxon, locality, year), maps them to Arctos search fields, and generates valid Arctos search URLs. It uses rule-based parsing for query interpretation, singularization of common names, special field handling (e.g., is\_tissue, part\_search), and conditional logic for taxonomy mapping.Additionally, the Streamlit chatbot includes Google Sheets logging functionality: every search query, along with its extracted fields and generated URL, is automatically logged with a timestamp in a shared Google Sheet. This provides a transparent, structured record of usage for future analysis, monitoring, or refinement of the chatbot’s performance. The app is publicly deployed on Streamlit Community Cloud and open-sourced via GitHub, with all logic, UI code, and deployment configuration documented for ease of maintenance.
3. **Documentation**: As the above deliverables require transfer of knowledge, a step-by-step user guide for the dashboard and chatbot will be important to ensure no knowledge is lost and managing these tools can continue beyond this Practicum’s span. This document will outline how to utilize the dashboard and chatbot as well as instructions on how to deploy it and update it, serving as technical documentation for maintenance and future improvements by the Arctos team.
4. **Handover Workshop / Training Session**: Our team will walk through the steps to update the dashboard and chatbot over Zoom, showing Arctos staff and programmers how to use the dashboard and chatbot effectively. This final training session will capture final feedback and answer any remaining questions.

### Delivery Method of Deliverables

1. **Tableau Dashboard**: The finalized Tableau dashboard will be delivered in two formats. It will first be delivered as an interactive Tableau Public link on team member Shivani Tayade’s account, where it is currently hosted. This allows for immediate use and interaction, as the Tableau dashboard is currently available on the Arctos website. The file containing the Dashboard will also be transferred to a Tableau public account managed by Arctos.

The second format is a packaged workbook file shared via Google Drive for backup and archival purposes. A fully packaged Tableau workbook file will be transferred to the Arctos team to enable future customizations, updates, and rehosting on the institution’s own Tableau server or online workspace as desired.

1. **AI-Powered Chatbot**: The two chatbot prototypes will be delivered in modular, editable formats. The GPT-based chatbot does not consist of code, but is hosted on OpenAI’s ChatGPT as a custom GPT. The instructions given to the custom GPT will be retrieved and shared to the Arctos team as a written document and shared via GitHub. As the custom GPT cannot be handed over to another ChatGPT account, the guidelines used to build the custom GPT will have to be fed to another custom GPT made by and maintained by the Arctos team.

The second chatbot is a fully functional, open-source Streamlit web app that accepts natural language queries and dynamically extracts key fields (e.g., taxon, location, date). It then uses a rule-based mapping layer to generate valid Arctos search URLs by calling the Arctos API and integrates responses from the OpenAI API (GPT-3.5). The app has a front-end interface, and backend code includes logic for query interpretation, singularization of common names, field mapping, and URL generation. API keys are managed securely using Streamlit’s secrets.toml. The entire solution is modular, editable, and deployed via Streamlit Community Cloud for easy public access, with the GitHub repository serving as the single source of deployment and documentation. In addition, the app logs each user query, extracts parameters, and generates a URL to a connected Google Sheet in real time using a Google Cloud service account. This provides a transparent record of usage activity and supports future analysis and monitoring.

1. **Documentation**: Documentation will be shared in the project team’s GitHub repository and includes the following:
   1. User Guide (PDF): A step-by-step manual on how to use the Tableau dashboard and the chatbots.
   2. Technical Manual: Includes setup and chatbot deployment instructions, guidelines for editing prompts or system messages, connecting to updated Arctos documentation, and how to republish the dashboard if data is updated.
2. **Handover Workshop / Training Session**: The handover session will be conducted over Zoom. It will include live walkthroughs of the dashboard and chatbot, demonstration of how to update the data for the dashboard, and demonstrations of how to update the chatbots. The session will also include a Q&A session to answer any final stakeholder or end-user questions. If requested, a follow-up office hour can be arranged.

### Deliverable Timeline and Dependencies

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| **Task** | **Planned Date** | **Dependencies & Notes** |
| *Finalize Tableau Dashboard* | Completed | Incorporate final data updates and verify accuracy of spatial analysis. |
| *Transfer Tableau Workbook File* | April 30 | Requires confirmation of preferred storage destination (e.g., Google Drive or GitHub repository). Also requires ensuring that there is enough storage space for the selected method. |
| *Document GPT Instructions for Custom Chatbot* | May 13 | Retrieve current prompt structure and settings from ChatGPT; validate with Arctos team that format is reproducible. |
| *Publish Streamlit Chatbot App & Documentation to GitHub* | May 15 | Ensures the Streamlit app is functional, OpenAI and Arctos API keys are secured, and the GitHub repo includes the full codebase, documentation, and deployment instructions for Arctos use. |
| *Finalize Documentation (User Guide + Technical Manual)* | May 20 | Relies on final versions of dashboard and both chatbots to ensure complete and accurate instructions. |
| *Prepare for Handover Workshop* | May 24 | Includes scheduling a Zoom session with Arctos team, preparing slides, test-running the demos, and gathering final questions. |
| *Handover Workshop & Training Session* | June 1 | Live walkthroughs of the dashboard and both chatbots. Attendance from Arctos staff and stakeholders desired. |
| *Optional: Office Hours or Follow-Up Support* | Upon request | Arranged based on feedback from the handover workshop. |

### Intended Recipients

1. **Tableau Dashboard**: Arctos team, particularly the developers and Arctos leadership such as Michelle Koo, the MIP. The dashboard can also be extended to be available to curators or researchers who are interested in exploring the dashboard and editing it to fit their own needs, if allowed by the Arctos team.
2. **AI-Powered Chatbot**: Arctos programming team. The deliverables will be transferred to the programming team to ensure they can be replicated or used with accounts managed by the Arctos team.
3. **Documentation**: Arctos team, particularly developers and programmers, staff, and leadership. Some parts of the documentation such as the user guide will also be intended for curators and researchers that use data from the Arctos Consortium. Other parts of the documentation such as the technical guide will be directed primarily to the Arctos team so they can continue to update the deliverables as needed.
4. **Handover Workshop / Training Session**: Arctos team, particular developers, programmers, and leadership. The training session and handover workshop will also be helpful for the MSBA team, as it will help our team clear up any questions that the Arctos team may have regarding the deliverables and the documentation. Attendees will primarily be from the main Arctos team, such as MIP Michelle Koo and programmers recommended by Michelle.

### Intended Impact and Effect

Together, the deliverables below represent a meaningful and sustainable enhancement to the Arctos user experience. The Tableau dashboard offers immediate insights for decision-makers, the AI-powered chatbots lower barriers to access for a diverse user base, and the comprehensive documentation and training ensure that the tools are maintainable and scalable over time. The success of the practicum will ultimately be measured by the extent to which these solutions are adopted, integrated into existing workflows, and continue to empower the Arctos team and broader research community long after the project concludes. By delivering tools that are functional, user-centered, and future-proofed, this engagement sets the foundation for lasting impact.

1. **Tableau Dashboard**: Enhances visibility into Arctos system usage and institutional contributions, supporting data-driven decision-making for both internal management and external reporting. By providing an intuitive visual summary of complex records data, it improves stakeholder engagement and empowers curators and researchers to identify patterns and opportunities for curation, outreach, and data entry improvements. The dashboard’s long-term value lies in its adaptability and its potential integration into Arctos's core infrastructure.
2. **AI-Powered Chatbot**: Significantly reduces the cognitive and time burden associated with constructing Arctos queries, especially for non-technical users. The GPT-based chatbot improves accessibility by allowing natural language interaction, while the code-based chatbot provides a customizable, scalable foundation for future development. Together, they demonstrate the feasibility of assistive tools that can evolve alongside Arctos documentation and user needs.
3. **Documentation**: Ensures long-term sustainability and independence of Arctos staff in managing and evolving the tools. Clear documentation facilitates smoother onboarding, reduces reliance on the original project team, and promotes tool adoption across technical and non-technical user groups. It also demonstrates best practices for reproducibility and institutional knowledge transfer.
4. **Search Logging & Future Insights:** The integrated logging of search queries into Google Sheets creates a lightweight, live dataset of real-world usage. This record not only supports transparency and monitoring but can also serve as a valuable resource for future research into user behavior. Over time, patterns in query types, taxon frequencies, institutions of interest, and common geographic filters can be analyzed to understand researcher needs and inform improvements to both the chatbot and the Arctos platform itself. This lays the groundwork for data-driven feature prioritization, trend analysis, and broader usability research.
5. **Handover Workshop / Training Session**: Builds capacity within the Arctos team to confidently use, maintain, and enhance the deliverables beyond the practicum. The session strengthens the relationship between the practicum team and MVZ / Arctos stakeholders, reinforces trust in the tools provided, and ensures a smooth transition. The feedback gathered during the session also serves as a final validation of the project's usability and value.