

Software/Tool Comparison Worksheet

Criteria	Evaluation
Name	Arctos
Website/Contact	Home Page http://arctos.database.museum/home.cfm Contact form to ask about participation, etc: http://arctos.database.museum/contact.cfm
Description	Arctos is an ongoing effort to integrate access to specimen data, collection-management tools, and external resources on the internet.
Computer hardware Operating system Supplementary software	No software installed—all interface is via the web. Need a good browser and an internet connection.
Additional hardware/software required	None.
Features	<p>Specimens are the core of Arctos. Traditional museum "label data" live here. Attributes allow collection-specific determinations of most anything that can be recorded from a specimen, such as sex, weight, age, and various measurements. Specimen Parts are the physical objects, and are grouped as Cataloged Items, which represent one or more biological individuals. Cataloged items may be encumbered in order to restrict access to objects or data. Other Identifiers record any number assigned to a specimen, and may form links to external resources such as GenBank.</p> <p>Containers hold specimen parts and other containers in a flexible recursive model. Containers may be barcoded. Some containers hold fluid, and record a history of concentration and monitored dates. All containers maintain a position and condition history.</p> <p>Transactions consist of loans, accessions, and borrows, and may be grouped through projects.</p> <p>Localities record descriptive spatial and coordinate data, along with collecting methods, habitat, and dates.</p>

	<p>Agents are people, groups, or organizations that collect specimens, determine identifications, attributes, and coordinates; create, authorize, and participate in transactions; author publications and act in various other roles.</p> <p>Publications are attached to specimens by way of citations and are often created by projects.</p> <p>Projects create and use specimens, produce publications, group taxonomy into checklists, and record usage of specimens in the absence of formal citations.</p> <p>Taxonomy forms the basis for identifications and citations. Taxa may be related to each other and to any number of common names in any language.</p> <p>Media attaches digital resources to specimens, people, places, and publications. TAGs graphically reference images to specimens, places, and people. Documents paginate scanned publications, such as field notes.</p>
<p>Market presence</p>	<p>As of 25 April 2013, Arctos included 1,739,255 specimens and observations in 61 collections.</p> <p>History:</p> <p>MVZ: 1995–Hired Stan Blum to develop relational data model (following modeling by Assoc. Systematic Collections).</p> <p>MVZ: 1997–Hired John Wieczorek to implement model (desktop application) using Sybase and Versata. Partial implementation (e.g., no loans).</p> <p>UAM: 1998-2000–John Wieczorek migrated mammal data to Oracle, set up Versata.</p> <p>UAM: 2002–Dusty McDonald replaced Versata with ColdFusion, implemented full model (first web-based instance, aka Arctos).</p> <p>MSB: 2003–Joined Arctos at UAM (first multi-hosting instance).</p> <p>MVZ and MCZ: 2005-2007–Implemented separate instances of Arctos at Berkeley and Harvard (MVZ: first Postgres, then Oracle).</p>

	<p>MVZ: 2009–Moved hosting of data to Alaska (Virtual Private Database version).</p> <p>MVZ/UAM: 2012–Moved hosting to Texas Advanced Computing Center</p>
Initial cost	<p>Negotiable. Arctos's infrastructure is highly scalable, so the addition of contributing participants can reduce the cost per participant. Incoming collections must negotiate an understanding about these costs with the Arctos Steering Committee, which is comprised of executive representation from the four supporting museums. At a minimum, collections must support formatting, cleaning, and uploading their own preexisting digital data. Arctos programmers may assist with migration of data into Arctos if negotiated in advance with the Steering Committee. In funding proposals, potential participants should state their intention to use Arctos only when they have obtained a letter of support from the Arctos Steering Committee. It has been essential to the development of Arctos that major proposals always request support for the development of new features.</p> <p>More at: http://arctos.database.museum/info/participate.cfm</p>
Maintenance cost	<p>Participation annual fee – see above. May want to replace older slower computers with newer faster ones.</p>
Ease of setup/ prerequisite skills	<p>Obtain password, enter data online.</p>
Continuing IT support required?	<p>For active and growing collections, yes. For a static database, no.</p>
Special skills required for maintenance	<p>None.</p>
Challenges	<p>Here are pros and cons based on Derek Sikes' presentation at the iDigBio Dried Insect Digitization Workshop (25 Apr 2013).</p> <p>The learning curve is fairly steep.</p> <p>Can't customize to your heart's content, each change to the database structure and function must be voted on and</p>

	<p>prioritized by other users.</p> <p>Web access sometimes slower than ideal.</p> <p>Only available when networked. Field work in remote areas requires special solutions if data are to be accessed.</p> <p>User interface is ~ garish, clunky, industrial (but works).</p> <p>Many tasks take longer, but it's worth it.</p> <p>Pros: Rock-solid security, the data will outlive you (hopefully).</p> <p>Web-published 100%.</p> <p>Cutting-edge web integration (mapping, GenBank, BOLD, etc.).</p> <p>No responsibility on your part to maintain backups, software updates, etc. Need only a networked computer.</p> <p>Arctos programmers and designers are biologists/users who really care about "doing it right."</p>
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