FY 07-08 IT Budget Proposal
Director, Berkeley Natural History Museums (Sponsor): STEWARDSHIP & SHARING OF DIGITAL ASSETS OF THE BERKELEY NATURAL HISTORY MUSEUMS: A MODEL FOR RESEARCH – IST COLLABORATION, PHASE II
ABBA Category One: Discovery
ABBA Category Two: Research

For more information about this proposal, contact: Craig Moritz (Director, Berkeley Natural History Museums).

The Berkeley Natural History Museums and Field Stations (BNHM) are a world-class resource that underpins the campus’s mission and strength in research, teaching and public service. As leaders in the innovative use of information technology to support these functions, BNHM members have collaborated internally and with IST for decades to digitize collections, develop databases, build web-portals and perform web-based outreach to the research and K-12 community. In 2005-06, the Berkeley Natural History Museums and IST conducted a strategic planning effort with the goal of developing a more coordinated and sustainable system for managing, protecting, developing and sharing these digital assets. Already, this has resulted in more effective and efficient use of resources and expertise. For 2006-2007, the campus provided one-time funds that were used for Phase I of the BNHM-IST Re-Architecture project. The goals for Phase I have been to complete the assessment of systems and needs, identify a target architecture for future development, develop an implementation plan based on prioritized needs, and ensure that appropriate governance and organization structures are in place. The target architecture selected (to be determined by discussion with IST architects) is driven by a shared services model that is more efficient and emphasizes reuse while still supporting flexibility and innovation.

For Phase II of this project (years 2007-2008 through 2009-2010), the Berkeley Natural History Museums and IST propose to implement the technological plan and organizational changes identified in Phase I. While much of the focus remains on the members of the BNHM consortium, a key component of this implementation plan is to begin developing and delivering services that have broader campus impact, serving the needs of other museums and of the research community in general. The complete scope of Phase II extends beyond the funding requested here and involves redirecting existing resources within IST and the BNHM. Additional funding is requested to support work in the following areas: a) collections management systems, b) the Media Vault (a digital asset/repository/preservation service), c) geospatial services, d) risk assessment and mitigation, and 3) network connectivity in the field stations. Project plans in these areas start with work that addresses existing problems while simultaneously building a foundation for shared services that can be used by the wider campus audience.

Collections management systems: A phased effort will focus initially on mitigating risks in several museums. Some of these rely on a legacy technology (e.g., the Essig Museum of Entomology, the UC Botanical Garden, and the University and Jepson Herbaria) while others are expensive vendor systems that lack needed capabilities (e.g., in the Phoebe Hearst Museum of Anthropology).

Media Vault: BNHM members, other museums and faculty in general have expressed an urgent need for services that facilitate the acquisition (i.e., scanning), organization, secure storage, and use of digital content such as digital images and video. Members of the BNHM consortium coined the phrase "media vault" to describe this capability. The initial focus here will be on extending proof-of-concept work that started in 2006-2007 using the Extensis Portfolio product, providing valuable experience in this domain and solving
problems faced by customers such as Phoebe Hearst Museum of Anthropology and History of Art's Seurat collection. This work will be used to identify needs and issues that our campus faces in the digital preservation area. It is likely that a major budget proposal will for digital preservation will emerge from this work.

**Geospatial services**: BNHM has pioneered the development of geospatial, GIS and mapping services for biodiversity research via the applications such as the BerkeleyMapper system. Ongoing development of this platform will enable more geospatial capabilities for more kinds of collections and researchers.

**Risk assessment and mitigation**: A complete risk assessment effort must be conducted to understand potential vulnerabilities at the data, hardware, application and organizational levels. Already it is known that single servers are hosting too many functions (e.g., general web sites and database gateways) and that development work and production systems are not separated according to best practices. Therefore, BNHM and IST will continue to move appropriate functions and services to the Data Center. This will result in one-time and ongoing costs.

**Network connectivity for the field stations**: The field station members of the BNHM consortium play an increasingly important role in integrating ecological and environmental data and performing biodiversity research. In order to support the research that the field stations are performing, basic network infrastructure improvements are urgently needed.

1. **Alignment with IT Strategic Plan**

This project addresses Critical issue 3 (Research), especially point 4 (Data stewardship and digital asset management). In addition, this project is aligned with Critical issue 1 (Teaching, learning – especially point 1, Support of research-based learning), Critical issue 4 (Security, access and reliability), Critical issue 5 (Governance, funding and structure), and Critical issue 6 (Expertise).

2. **Impact**

The project described here will have very major impact on the museum faculty, curators, and students that work in the Berkeley Natural History Museums. Outreach activities to other institutions and the K-12 community broaden the scale of this impact. Furthermore because this work is intended to have benefits beyond the BNHM members, the likely impact grows accordingly. In five to ten years, strategically this project will enable ...

3. **Risk assessment**

A set of risks for this project have been identified in gathering business requirements. These range from technological (e.g., moving to a very different platform such as service-oriented architecture) to organizational (e.g., being able to make effective decisions in a decentralized environment). However, the current approach to this work is unsustainable from many perspectives, and so the risk of not performing this work is unacceptably high.

4. **Innovation**
This effort is very innovative in that new technologies and organizational structures will be deployed. At the same time, it builds on successful experiences that have demonstrated that a collaborative approach is beneficial.

5. Funding model

The funding model for this budget request supports the three-year plan to a) implement the BNHM-IST Re-Architecture technology projects and organizational plan and b) begin delivering campus-wide informatics services in support of research and scholarship. This funding model benefits from and builds on existing partnerships between the CIO office, the VCR office, IST, the Berkeley Natural History Museums, other museums, and various campus partners such as academic departments (e.g., Anthropology, Art History, and Architecture), the Library, and Educational Technology Services.

This proposal requests funding for salaries (including current and new staff positions), infrastructure costs (including one-time networking and one-time and ongoing hardware refreshment), GSR support, and staff development and training.

1) Current staff: Over the next three years, three fulltime FTE positions require partial funding (15% to 25% salary coming from the museums) to provide support for existing systems, to begin building the new BNHM systems, and to participate in campus-wide collaborations in specific areas (geospatial services, collections management systems, sensor networks technologies, and the media vault).

2) New staff: Four new fulltime positions are requested for three years in order to support two of the most complex and important systems that are the heart of the Re-Architecture project and campus-wide research informatics in general.

   a. Collections Management System: The development of a framework for collections management systems requires two new positions. The first, a PA III analyst/designer, will perform analysis and design work to identify the detailed technical design that will be implemented. The second, a PA IV developer/software engineer, will perform the development needed.

   b. Media Vault: Two new fulltime positions are requested. The first, a PA IV Digital repository and Asset Management Specialist, will direct and develop a state-of-the-field preservation repository for the campus. The second, a PA III digital preservation specialist, will align these efforts to policies and national/international standards and best practices, as well as help to define the next generation of repository, preservation and dissemination services.

3) Field station network connectivity: The field stations and IST-Infrastructure Services have identified preliminary costs for a sufficient combination of T1, microwave, and satellite installations and other infrastructure. Additional detailed cost analysis will be performed to identify the ideal solution for each field station.

4) Hardware costs: Attached to the risk assessment and mitigation effort will be costs associated with moving servers to the colocation facility (six instances of the Unix/Apache Web Farm Service).

5) Consulting costs: Consulting time from IST-Infrastructure Services and IST-Application Services will be used to identify the appropriate distribution of applications, data and servers (200 hours).

6) GSR support: A 50% GSR position will be employed for three years as needed to perform research and conduct focus sessions.

7) Staff development and training: Training will support the development of existing staff to new languages and platforms.
## Summary of Funding Model: [Sponsor: name of proposal]

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**Note:** In accordance with the University’s accounting system, positive numbers are expenses or deficits, while negative numbers are funding or surpluses.