

Proposal for an iLab Consortium

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Rationale for a Consortium

The iLab Project at MIT has created a scalable architecture (the iLab Shared Architecture or ISA) to support access to online laboratories (iLabs). The iLab effort is unique in having separated the responsibility for creating online labs from the responsibility for administering the students who use them. This feature is critical for scaling the number of users of a particular lab and for expediting the development of new labs.

As the usage of online experiments gains traction in the educational community, there is increasing interest in developing such labs on a common infrastructure. A unified architecture is essential to convert the current tremendous interest for online experiments into an economy of labs that can be efficiently shared around the world. We believe that the ISA is a viable candidate for such a common infrastructure. Until recently, MIT has developed the iLab infrastructure largely alone, but other universities including the University of Queensland in Australia, Obafemi Awolowo University in Nigeria, and Makerere University in Uganda are creating the majority of new online labs. This unbalanced organization is insufficient to propel the ISA to become an international standard.

iLab Consortium Goals:

Evolving from a project to a sustainable on-going community of equally committed members requires transforming interest into commitment. This commitment can be structured as a consortium whose core goals are:

- To encourage and support the creation of new online labs and curricular materials for them;
- to design an efficient mechanism for sharing, exchanging and trading access to online labs;
- to support communities of scholars created around iLabs; and
- to lead the evolution of the iLab Architecture.

Consortium Advantages:

Creating a consortium to own the ISA intellectual property, to guide its future development, and to ensure its sustainability has the following advantages:

- A consortium would encourage the future development of the ISA to be guided by a broader set of requirements and use cases than a single institution could envision.
- Universities and other educational partners considering the adoption of online labs are more likely to do so if they believe that the underlying architecture is supported by an organization to which they belong rather than by a single university, whose involvement depends on soft money.
- A consortium with a broad membership is a better political organization for fairly balancing the costs and benefits of the many new features that have been and will continue to be suggested for the ISA.

- A consortium will be a better organization than a single university to evolve multiple business models to support popular online labs for many years.
- A consortium is better suited to gather and publish best practices for the multiple communities that may create and use online labs.
- A consortium will be better able to bridge across the communities (university, K-12, commercial, media, training organizations and museums) that may all wish to be involved in online labs.

Guiding Principles

The consortium will accept three types of members: educational *partners* (universities, colleges, schools, and museums), corporate *affiliates* (for-profit companies), and government and non-profit *associates* (professional associations, foundations, government agencies).

The consortium in its incorporation as a non-profit entity, like its predecessor, the iLab Project at MIT, will remain committed to an open source software policy that also permits the commercial packaging and release of iLab implementations. At the same time, the consortium must collaborate with companies that develop lab equipment and scientific software as well as those that publish textbooks and curricula. Such companies should be encouraged to provide technical input to the consortium as well as to commercialize its open source software. Governance of the consortium, however, should remain in the hands of educational institutions rather than those of commercial affiliates.

The consortium must provide a mechanism for the entire community to voice its needs and priorities. At the same time, decision making should not require consensus, and a member's role in the consortium should be proportional to that member's contribution to the overall effort.

One historic and one current consortium provide particularly good parallels to the proposed consortium. The MIT X Consortium and its successor the X Consortium shepherded the development of the X Window system from a university-centered development project to an industry-wide de facto computing standard with multiple compatible implementations available through separate vendors. The OpenCourseWare (OCW) Consortium has evolved from a single university effort to a worldwide collaborative project to make university course materials available to all. It provides a good model of how very different institutions can all contribute materials to advance a common cause.

The Expectations and Privileges of Members

All educational and corporate members will be expected to contribute to the iLab effort in one or more of three ways: through financial support, in enhancements to the ISA infrastructure, or through contributions to the set of iLabs and related curricular materials available to the members. Not all educational partners will be able to develop new iLabs, but those that cannot do so should be able to make valuable contributions in the form of experiment descriptions and associated curricular materials. All members will be expected to share their expertise with other members through workshops and informal

contacts as well as to act as advocates for online labs within their community. Consortium dues for educational and corporate members will be based on a sliding scale as in the W3C Consortium, depending on the type and size of organization and the country in which it is located. The membership requirements for government and organizational associates will be negotiated on a case by case basis.

Benefits for members fall into three broad categories: access to iLabs and resources, participation in consortium activities and access to funding opportunities. While most benefits will be open to all members, some benefits such as participation on the four iLab Standing Committees will be linked to a member's level of contribution to and participation in the consortium.

Non members will have access to the standards documents, all open source software, and the publicly disseminated demonstration experiments. Members will have the following additional privileges:

Access to Resources

- Preferential access to iLab experiments and educational resources made available by consortium members
- Technical support for iLab developers and staff administering student use
- Cross institution collaboration with iLab faculty and developers
- Training and professional development opportunities through iLab workshops
- Increased opportunities to work with colleagues through developer exchanges
- Richer educational opportunities through co-supervision of students and research teams
- Consortium brokered equipment and software discounts

Participation in Activities

- Participation in research and development meetings to shape the ongoing development of the ISA
- Advocacy on current issues facing Consortium members
- Eligibility to lead or participate in technology development teams
- Eligibility to serve on the four iLab Standing Committees (see below)

Funding

- Assistance in seeking research funding
- Ability to apply for iLab Consortium funding when available
- For commercial partners, the ability to market certified iLab-compatible products

An Overview of Governance

The consortium will need to make decisions in four main areas:

- Policy and Administration;
- Technology including the specification of iLab Shared Architecture APIs and the development of new reference implementations;

- Economics including both the development of a plan for the financial sustainability of the consortium and the creation of business models to support existing online labs and the implementation of new ones;
- Education including evaluation, the determination and publication of best practices, dissemination of iLab experiments and the authoring and sharing of educational materials in support of particular online experiments.

Each of these four areas should be governed by a separate management committee. Each of the latter three committees (Technology, Economics, and Education Committees) should ultimately be responsible to the first (Policy and Administration Committee) but should make their decisions independently.

The detailed mechanism of governance will not be fixed at the start of the consortium, but will be allowed to evolve during the consortium's initial year to allow a wider group of members to contribute to the formation of the decision making process. We believe that the creation of the iLab Consortium will pass through three stages:

1. A pre-consortium quiet stage (underway) during which the founding members will clarify consortium goals and policies. They will also seek major funding to start distributed development of the next generation ISA capable of handling 2-3 orders of magnitude more users than the current architecture and to implement new online labs to be shared with members.
2. A consortium formation stage (starting with the identification of initial funding) during which the founding members will enlist a larger group of institutions to discuss and determine the governance structures. The four governing committees will start operation at this point.
3. A period of open enrollment and rapid growth (after agreement on consortium governance) that will commence with the formal launch of the consortium.

Next Steps

- Identify founding members; circulate and secure acceptance of a memo of understanding.
- Identify initial funding to launch the consortium.
- Hold a meeting of founding members to initiate discussion of consortium governance and planning.
- Develop a list of current iLabs whose providers are willing to share them with consortium members and make the labs and curricular materials available through a portal site.
- Develop a business plan to make the consortium self-supporting.
- Produce formal documents describing consortium policy and governance.
- Hold a conference to formally launch the consortium.