I. SPONSORSHIP

A. Initiative

<table>
<thead>
<tr>
<th>Initiative</th>
<th>IT INFRASTRUCTURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiative Manager</td>
<td>MICHAEL MUNDRANE (IST)</td>
</tr>
<tr>
<td>Phone</td>
<td>+1 510 642-6365</td>
</tr>
<tr>
<td>E-Mail</td>
<td><a href="mailto:mundrane@berkeley.edu">mundrane@berkeley.edu</a></td>
</tr>
</tbody>
</table>

B. Sponsorship

<table>
<thead>
<tr>
<th>Sponsor Name</th>
<th>Shel Waggener</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sponsor Signature</td>
<td>Date 4/14/2011</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sponsor Name</th>
<th>ITAC – William Allison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sponsor Signature</td>
<td>Date 4/14/2011</td>
</tr>
</tbody>
</table>

| OE Program Office Signature | Date |

C. Give the title of the resource

Service Oriented Architecture Infrastructure. (SOA)
OR
Campus Information Accessibility – Services, Registry, Application Environment Integration

II. PROBLEM STATEMENT/CASE FOR CHANGE

A. Identify and describe what needs the proposed solution is seeking to address.

**LEVERAGING THE CAMPUS DATA ASSETS** - The campus has struggled to make enterprise data easily available to application systems that are developed and supported distributively across campus. To obtain access to campus data is difficult and time consuming and once a developer has access to the data, it is hard to understand and use properly. The result is numerous shadow systems, duplication of data, duplication of data entry, inefficient use of IT resources, and longer application development time. Such disparate development efforts often result in avoidable inefficiencies and redundancies. The need to use data across systems is becoming a serious obstacle to our ability to deliver seamless applications and leverage the efforts of all campus developers. Our current mode of providing Oracle views to access data will pose a major challenge to projects like Sakai 3, the Student portal going forward, and future changes to existing systems. Enabling API-based access to critical information assets will allow campus developers and desired visionary IT solutions require application building blocks, like data services, to expedite and standardize the implementation of IT business applications, improve
ongoing support, and the ability for the systems to be flexible.

**APPLICATION BUILDING BLOCKS FOR REUSABILITY AND SWAPPABILITY** – The challenge is how to improve, speed-up, increase agility and flexibility of our application development process and the resulting systems. The campus is application hungry. Current methodologies are rigid and unable to keep pace with the changes needed by the business process. Organizations can become locked into technology, applications and platforms that are no longer the best choice for them. This rigidity causes an inability to implement changes in business process, roles, security and data structures in a cost-effective way. The expectation is significant benefits by moving beyond inflexible and costly integration methods to implement loosely coupled Web services. Using a services based architecture, we can create an application environment that is technology and platform agnostic, enabling IT to efficiently and cost-effectively implement change.

- *Scales*: Continually optimizes performance and functionality.

B. Describe the solution that is being proposed to meet the identified need(s).

1) **Production data services from operational data stores (DB2/Oracle in Enterprise and Departmental systems) and Campus Data Warehouse for key enterprise data.** ***Services will be prioritized and completed as funding is available.***

2) **Web Service Repository/Registry** that supports registering, discovering, documenting and monitoring web services. Included in this deliverable is the development of the metadata and documentation framework that will be required to be completed for all production web services.

3) **Service templates.** Guidelines and processes for web service development and data sourcing and web **service templates** for: a) simple data service, b) simple secure data service, and c) simple secure update data service, d) business process service.

4) **Sample mash-up** – will be developed to provide a framework for additional future development. A mash-up combines data, presentation or functionality from two or more sources to create new services.

5) **Service Deployment Environment** (Tomcat, ServiceMix/FUSE-ESB).

6) **Recommend a Governance Structure** (Priority setting) and **funding model** (one-time and ongoing).
   a) **establish priorities** for the development of services using central resources
   b) ensure that new web service development is coordinated and provides maximum reuse potential for campus
   c) provide design and documentation reviews prior to production publication for web services developed by any project team
   d) development of a **funding model** for ongoing expenses.

C. We will be looking for project and permanent funding to support:

1) Web services development and ongoing support.

2) The implementation of a Web Service Repository/Registry and ongoing support.
3) Web service and mash-up guidelines for all application development programmers to follow.

4) The implementation of an ESB (ServiceMix w/Fuse) and ongoing support.

**REQUIRED RESOURCES FOR 2 YEARS:**

3 Senior Developers
1 Business Analyst
.25 Build Engineer
.5 Developer/Tester
.25 Developer to implement/support the registry
.25 Project Manager
.5 Senior Developer – Knowledgeable in current data structures

continue on this model of application development.

**IMPACT AND STRATEGIC ALIGNMENT**

A. Describe how the proposed solution aligns with the OE goals:

- Reduce administrative costs and enable the campus to direct more resources to teaching and research
- Advance an effective and efficient operating environment
- Instill a culture of continuous improvement that leads to high quality performance and outcomes

The use of application building blocks, in this case, services and the infrastructure to use them effectively (ESB, Service Registry) will

1) streamline application development by providing data access code that all can use
2) make our systems less rigid, more flexible and able to more easily change
3) reduce application development costs
4) enable us to write more flexible application systems which in turn are better able to evolve to meet changing business needs.

An SOA environment should make application development on campus easier and more efficient. The application solutions will become more flexible since they can be built on application building blocks, the assembling of services. Making access to campus data easier will reduce the need for shadow systems, duplication of data, and duplication of data entry, increase the efficient use IT resources, and shorten development time. Example: It may take 3 months to design and program a specific Web service that is available for use by many. If a single application was defined and programmed with the necessary access obtained, it might take 1-2 months, but only that one application would benefit. Instead, if 3 programmers can leverage 1 service there would be a net savings.

B. Identify any other anticipated benefits in implementing the proposed solution.

1) Efficient Path to migrating from legacy systems, as software systems and business units that depend on API-based access to information would not be impacted by the migration.

2) Substantial cost reduction by eliminating the redundancies, errors, and security risks inherent in the current approach of ad hoc data access.

3) Improved operational efficiency in business units that are poised to leverage the advantages of unhindered access to live data.
4) New capabilities to serve the campus population, in the form of IT opportunities (mobile, mash-ups), and new business processes (enrollment concierge, online advising).

5) A foundation for enabling enterprise computing strategies.

C. Identify the risks of not implementing the solution.

1) Additional difficulty migrating to newer systems. Basically, several of the OE proposals will not be able to go forward including:
   a) Sakai 3.0,
   b) Student Portal,
   c) Advising Tool Kit,
   d) Workflow Forms with Pre-filled Campus Data,
   e) Course Evaluation Tool,
   f) Academic Planning and Registration System

2) Inability to leverage current campus data assets.

3) Inability to leverage current application code.

4) Knowledge by staff of existing data (structure, content, proper interpretation) is limited to some key staff. Unavailability or loss of data knowledgeable staff before documentation and preparation of the services pose a risk.

5) Difficulty attracting new developers who don’t want to be burdened with out-of-date technological development environment.

D. Describe the constituency that is intended to benefit from the proposed solution (e.g. students, faculty, staff, 1-many units)

Direct benefit to all Campus developers. This should make their application development easier, faster, and easier to maintain and change. Services will also buffer them from changes in the underlying data structures and technology.

Indirect benefit to the entire campus community that depends on campus applications to get their work done. This would include student, faculty, and staff across the campus that benefit from UCB’s ability to provide IT business solutions in a timely manner and can evolve them as the business and technology requires.

E. Describe the extent to which this proposed solution is a collaborative effort either within campus or with external partners.

Providing an infrastructure that can support a service oriented development environment and services to key, core campus data, will allow both campus developers and, where appropriate, external partners like UCOP, other UC’s, and vendors that provide campus solutions and need data interfaces, to easily leverage campus data and business process services to meet system needs.

F. If applicable, describe how the proposed solution may enable additional projects to be considered.

This is a foundational infrastructure that supports application development in the future. OE projects already proposed dependent on this infrastructure include:
   a) Sakai 3.0,
   b) Student Portal,
   c) Advising Tool Kit,
   d) Workflow Forms with Pre-filled Campus Data,
   e) Course Evaluation Tool,
   f) Academic Planning and Registration System

An SOA approach to data integration will also benefit other enterprise system interactions, including integration...
of Systems of Record (HCM, Student Systems) with downstream customers like the Identity Management system, Library, RSF, RSSP, and possible future systems like Bedework, and Grouper.

G. What is the impact of the proposed solution on the existing systems and processes? Does it eliminate the need for existing systems and processes?

The availability of data services that are easy to use does not replace any current systems but will be an enabler for new systems.

H. What is the impact on the proposed solution on the workload?

<table>
<thead>
<tr>
<th>Profile/Impact in hours</th>
<th>Current Workload</th>
<th>1-time workload requirement</th>
<th>Ongoing workload requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Staff (App Developers using the Services)</td>
<td>There is one-time work involved in converting from data views or shadow files to services that deliver enterprise data in existing systems.</td>
<td>Minimal. Should reduce development time of projects that require central data.</td>
<td></td>
</tr>
<tr>
<td>Staff (App Developers providing Services)</td>
<td>The design, documenting, coding, and testing of the services.</td>
<td>Ongoing support and maintenance of the services and addressing usage issues.</td>
<td></td>
</tr>
<tr>
<td>Faculty</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

III. WORK PLAN AND PROPOSED SOLUTION DESIGN

A. Provide a statement of:

• Deliverables — results the solution must deliver to achieve the stated objectives.
• Constraints — factors that may limit the options for providing the solution (e.g., an inflexible deadline).

Deliverables

1) Production data service development from operational data stores (DB2/Oracle in Enterprise and Departmental systems) and Campus Data Warehouse for:
   a) class (schedule read from Oracle data),
   b) course (catalog read from Oracle data),
   c) calendar (create appointments / events on multiple calendars (Google, Bedework),
   d) program requirements (read from DARS),
   e) class enrollment (read from Oracle data),
   f) student financial aid (read only of student financial aid status and details),
   g) student payroll (may want to generalize),
   h) awards,
   i) student accounts,
   j) other course and class data from bSpace.
   k) other course and class data from departments (example Law),
   l) registration (multiple services required for enrollment, class registration, fees, wait-list),
   m) undergraduate breadth requirements.

*** Services will be prioritized and completed as funding is available. 

2) Productionizing pilot services. The pilot web services that were written as a proof-of-concept and funded through a 2010-2011 IST Block Grant will be made production-ready. Production web services include complete use-cases, load testing, extensive error handling, security, web service registration and documentation.
   a) Productionize department service.
b) productionize registration status service.

3) **Web Service Repository/Registry** that supports registering, discovering, documenting and monitoring web services. An example of a registry under consideration is the open source BioCatalog. Included in this deliverable is the development of the metadata and documentation framework that will be required to be completed for all production web services.

4) **Sample mash-up** – will be developed to provide a framework for additional future development. A mash-up combines data, presentation or functionality from two or more sources to create new services. The mash-ups under consideration include:
   a) Student class and calendar information
   b) Summary of student financial revenue and expenses with balances remaining.

5) **Service templates**. Guidelines and processes for web service development and data sourcing and web service templates for:
   a) simple data service,
   b) simple secure data service,
   c) simple secure update data service,
   d) business process service.

6) **Service Deployment Environment** (Tomcat, ServiceMix/FUSE-ESB).

7) **Recommend a Governance Structure** (Priority setting) and **funding model** (one-time and ongoing).
   a) establish priorities for the development of services using central resources
   b) ensure that new web service development is coordinated and provides maximum reuse potential for campus
   c) provide design and documentation reviews prior to production publication for web services developed by any project team
   d) development of a **funding model** for ongoing expenses

**Constraints and Risks.**

1) **Lacking Necessary IT Resources** - The necessary in-house resources or expertise to implement an SOA project. This lack of necessary elements can yield missteps and mistakes and extend the time required to create the services and provide the environment.

2) **Slow campus adoption of services** – Once the services are available, you are depending on campus developers to modify their systems to utilize the services. In some cases, this will be to replace code that does its own read of the central databases. In other cases, this is replacing their own data stores (shadow databases) to use central data.

3) **Not Spending Time and Resources for SOA Planning** – Careful planning and design is paramount. A) What services are best to invest in? Service enabling everything is costly and may not be necessary. B) Making sure to involve key players. Identifying who the necessary players are or who 'owns' the data. Which departments affect which services,
and vice versa. Otherwise the project could have roadblocks to acceptance. C) Involving business analysis to make sure the services are appropriately generic and address campus business needs. D) Reduce risk by tackling the smaller, lower visibility and lower risk projects first. This is a new approach for UCB. Beginning an SOA with smaller projects provides for a better learning experience and a base of confidence from which to build. Beginning by tackling the larger projects first, is high risk and could result in failure.

4) **Service security** - An infrastructure should be put in place to handle log-ins by proper credentials. Identity needs to be given a high priority.

B. Provide a work plan for the proposed solution with high-level steps to complete the solution, including timeline. (Try to limit your plan to no more than seven steps.)

<table>
<thead>
<tr>
<th>MILESTONE</th>
<th>TIMELINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Productionize IST Block Grant Pilot Services: Department, Registration, Course service.</td>
<td>Jul 1-Oct 1, 2011</td>
</tr>
</tbody>
</table>
| 2a. Class and Calendar Services.  
2b. Web service repository and registry. | Oct 1-Jan 1, 2011 |
| 3a. Prioritize desired services.  
3b. Business analysis and metadata on data needed by desired services. | Jan 1-Apr 1, 2012 |
| 4a. Enrollment services (example) | Apr 1-Jul 1, 2012 |
| 5a. Service deployment environment.  
5b. Service Templates.  
5c. Calendar, Enrollment, Class schedule mash-ups | Jul 1-Oct 1, 2012 |
| 6a. Program Requirements (DARS) (example) | Oct 1-Jan 1, 2012 |
| 7a. Student Financial services (example). | Jan 1-Apr 1, 2013 |
| 8a. Student Financials mash-ups. | Apr 1-Jul 1, 2013 |

C. What are the data requirements for the proposed solution?

The focus is enterprise student data, but the infrastructure would support data from any source. Data exists in the operational DB2, Oracle systems, the EDW, and department systems. Ultimately, this infrastructure could support the access to vendor data. (Data in a SAAS) and in fact be a requirement for future vendor and hosted solutions.

D. What are the technical requirements for the proposed solution?

ESB, Hardware: Servers, Web Services.

E. What are the greatest risks for the proposed solution and the plan to reduce or eliminate the risks.

<table>
<thead>
<tr>
<th>RISK</th>
<th>MITIGATION PLAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lacking Necessary Skilled IT Resources.</td>
<td>Hire an IT recruiter. Possible increase salary range for needed talent.</td>
</tr>
<tr>
<td>2. Slow campus adoption of services.</td>
<td>Offer training and templates for using the services. Communication. Eventually, shutdown of other means of getting the data (Oracle views, Data Extracts).</td>
</tr>
</tbody>
</table>
4. Service security. | Seek external review.
5. Lack of ongoing support for services to ensure appropriate evolution and refactoring. | Seek ongoing funding and or funding model to support SOA infrastructure.

F. How does the proposed work plan allow for evaluation and course correction to ensure the outcomes meet the campus needs?

Milestone review from OE steering committee. OE or TPO project manager. Review of milestone by key stakeholders on infrastructure consuming projects like Advising Tool and Portal.

1) CHANGE MANAGEMENT

A. What is the change management plan to successfully implement the outcomes of the proposed solution?

Standard IST change management methodology will be utilized. Workplan, documentation, key decisions, issues, tasks, bug fixes, testing/testing outcome, and customer sign-off will be tracked in confluence and jira.

IST steering committee with key OE project individuals depending on this will meet monthly to discuss status and any concerns.

B. What incentives and/or disincentives are proposed to influence behavioral changes necessary for the successful outcome of the proposed solution?

1) Improved access to better data will motivate developers to participate.
2) Reduction in costly and redundant effort in the units, will motivate campus developers to participate.
4) Communication, training, reference applications will encourage usage.
5) Will make getting access and using campus central data easier and less frustrating.

C. Who has been identified as the change leaders and implementers to carry out the changes necessary for the successful outcome of the proposed solution?

1) Sponsors of OE projects that benefit from this approach.
2) Campus IT leaders: CIO, DCIO, IST, CTC, ITAC, ITMF

2) FUNDING MODEL AND BUDGET

A. Could the proposed solution move forward with partial funding? If yes, describe the revised scope, including the associated savings impact.

No. The project has moved forward very slowly without funds from the campus, any successful solution requires this investment to ensure the technical and programmatic solutions are well aligned and the roll-out plan well supported and communicated.

Initial costs:
Staffing
• 3 Senior Developers
• .5 Business Analyst
• .25 Build Engineer
• .5 Tester/Developer
• .25 Developer to implement/support the registry
• .25 Project Manager
• .5 Senior Developer – Knowledgeable in current data structures

**Ongoing costs:**
**Staffing**
• 3 Senior Developers
• .5 Business Analyst
• .25 Build Engineer
• .5 Developer/Tester
• .25 Developer to implement/support the registry
• .50 PM-Campus Support

**Hardware-Consultants-Other**
FUSE ESB Support + 1 contact
4 servers (development, QA, production)

B. What is the plan for sustainable funding to support ongoing operations of the proposed solution?

Though there will be some savings by providers of central data (less time spent on one off solutions) and some savings by consumers of central data (ready to use solutions for accessing data and long-term minimizing impact on central systems data changes), retrieving that savings will be difficult and not significant.

This is a common good technology. Once its benefit is confirmed, senior management will have to decide if they want to support it with common funding or tax campus users.
APPENDIX

1. SOA Diagram – Integration Team Proposal 5

2. SOA Course Service

3. OE projects depending on SOA and Web services.
### Service-Oriented Architecture Infrastructure (SOA)

#### Funding Model: Sources (round to the nearest $1,000)

<table>
<thead>
<tr>
<th>Line #</th>
<th>Dept/Unit:</th>
<th>FY 08-09</th>
<th>FY 09-10</th>
<th>FY 10-11</th>
<th>FY 11-12</th>
<th>FY 12-13</th>
<th>FY 13-14</th>
<th>FY 14-15</th>
<th>FY 15-16</th>
<th>Cumulative Total</th>
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<td>1</td>
<td>Enterprise Application Svcs</td>
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#### Expenses (round to nearest $1,000)

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<th>FY 09-10</th>
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<th>FY 13-14</th>
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<td>Hardware purchase and refresh</td>
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#### FUNDING LESS EXPENSES

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<th>FY 08-09</th>
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<td>100</td>
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<td>980</td>
</tr>
</tbody>
</table>

#### Carryforward

<table>
<thead>
<tr>
<th>Line #</th>
<th>FY 08-09</th>
<th>FY 09-10</th>
<th>FY 10-11</th>
<th>FY 11-12</th>
<th>FY 12-13</th>
<th>FY 13-14</th>
<th>FY 14-15</th>
<th>FY 15-16</th>
<th>Cumulative Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>390</td>
<td>780</td>
<td>880</td>
<td>880</td>
<td>980</td>
<td>980</td>
</tr>
</tbody>
</table>

#### Cumulative Total

<table>
<thead>
<tr>
<th>Line #</th>
<th>FY 08-09</th>
<th>FY 09-10</th>
<th>FY 10-11</th>
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<td>22</td>
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<td>780</td>
<td>880</td>
<td>880</td>
<td>980</td>
<td>980</td>
</tr>
</tbody>
</table>

Source for actuals: (Name of BAIRS report and parameters used for source data, including month run and account information)
**Section V.E. Part 2: Line Item Description of Multi-Year Sustainable IT Funding Model and Budget**

Briefly describe the sources and uses specified below. Explain significant changes over time. Reference examples in Instruction worksheet or sample IT Funding Request.

### Title of Initiative: Service-Oriented Architecture Infrastructure (SOA)

<table>
<thead>
<tr>
<th>Line #</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Funding Model Sources</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Dept/Unit: EAS</td>
<td>Savings in Department and improve IT efficiency</td>
</tr>
<tr>
<td>2</td>
<td>Dept/Unit</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>IT Loan and payback (project)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Grant or other (specify)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>IT Bank Funding (project)</td>
<td>Staffing to write and support: Services, Service Bus, Service Registry (Prj Mgr, Bus Analyst Developers)</td>
</tr>
<tr>
<td>6</td>
<td>Other (specify)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Total Funding</td>
<td></td>
</tr>
<tr>
<td><strong>Expense Budget</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Salaries (including Project Manager, if applicable)</td>
<td>Staffing to write and support: Services, Service Bus, Service Registry (Prj Mgr, Bus Analyst Developers)</td>
</tr>
<tr>
<td>9</td>
<td>Benefits @37% or actual rate (specify if different)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Supply &amp; Expense</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Infrastructure services (backup, storage, co-location, network nodes, desktop support, etc.)</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Software licenses/upgrades/maintenance</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Hardware purchase and refresh</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Hardware maintenance</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Contract/consulting services (project management, development consultants, etc.)</td>
<td>Data Ctr Servers, ESB contract support</td>
</tr>
<tr>
<td>16</td>
<td>Office space</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Training &amp; Travel</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Other costs (specify)</td>
<td>If developer contractors must be hired, additional cost could be as high as 108000/yr for 3 FTE</td>
</tr>
<tr>
<td>19</td>
<td>Total Expenses</td>
<td></td>
</tr>
<tr>
<td><strong>Funds Less Expenses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Funds Less Expenses</td>
<td>Primarily Rounding due to benefits calculation @ 37%.</td>
</tr>
<tr>
<td><strong>Carryforward</strong></td>
<td></td>
<td></td>
</tr>
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<td>21</td>
<td></td>
<td>Primarily Rounding due to benefits calculation @ 37%.</td>
</tr>
<tr>
<td><strong>Cumulative Total</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Statement of Work
Enable API-based access to critical information assets.

Motivation
Many benefits that include:
• Efficient path to migrating from legacy systems, as software systems and business units that depend on API-based access to information would not be impacted by the migration.
• Substantial cost reduction by eliminating the redundancies, errors, and security risks inherent in the current approach of ad hoc data access.
• Improved operational efficiency in business units that are poised to leverage the advantages of unhindered access to live data.
• New capabilities to serve the campus population, in the form of IT opportunities (mobile, mashups), and new business processes (enrollment concierge, online advising).
• A foundation for enabling enterprise computing strategies.

Scope for Phase I-A
Provide public access to the following information assets:
• Course - read only, public access
• Class & Schedule - read only, public access
• Registration Status - read only, public access

Scope for Phase I-B
Provide secure access to the following information assets:
• Student Records - read only with coarse-grained security
• Student Profile - read only with coarse-grained security
• Enrollment - read only with coarse-grained security

Deliverables
• Production-ready service implementations
• Infrastructure configuration for a lightweight production environment
• Coarse-grained authentication / authorization
• Reusable development framework (architecture, components, and code templates)
• Registry, initial governance structure, and documentation

Team
• Three senior Java developers: 100%
• One business analyst: 50%
• One middleware / build engineer: 25%
• One tester / junior developer: 50%
• Registry support developer
• Manager

Resources
• Development server, QA server, and production server
• Support package from Fuse

Timeline
Five to six months.

Ongoing Support
Minimal support at this level. High demand and requests for new features would necessitate additional infrastructure and development.
Current Course Data Retrieval

Consumer 1
  Custom Integration for Views
    Oracle Views

Consumer 2
  Custom Integration for Batch Files
    Batch Files

Consumer 3
  Custom Integration for Data Extracts
    Ad Hoc Data Extract

Consumer 4
  Custom Integration for Screen Scraping
  Screen Scraping

DB2
  Direct Dependency

Direct Dependency

Direct Dependency

Direct Dependency

Direct Dependency

Direct Dependency

Direct Dependency
Proposed Course Data Retrieval

Consumer 1  Consumer 2  Consumer 3  Consumer 4

Course Information Service

Integration

DB2  Law School  CMI  UNEX
Projects that Benefit from a Web Services Approach

OE Projects :

The Sakai Online Course Evaluation Module with Berkeley Systems Integration
Technology and Tools to Support Excellence in Advising (Advisor’s Toolkit)
Academic Planning and Registration Tool Integration
Financial Planning and Bill Paying Tools
Academic Commons/Portal including a Student Calendar Interface
Time and Labor and the Payroll Interface

CTC Projects :

TeleBears/Periweb Mitigation Project
Kuali Student

OTHER Projects :

Student Mobile App for Online Schedule of Classes

What the above and many other projects across campus have in common is a need to get raw data and to present and consume it in easily understandable, meaningful ways and not be effected by the underlying technologies that support the data, where it comes from (Transactional system or Warehouse, DB2 or Oracle), or its collection.