



OE RESOURCE REQUEST APPLICATION

University of California, Berkeley

I. SPONSORSHIP

A. Initiative

| | | | |
|--------------------|---------------------------|--------|--|
| Initiative | IT Foundation | | |
| Initiative Manager | Pamela Brown / Karen Kato | | |
| Phone | 2-7059 3-3371 | E-Mail | phb@berkeley.edu kkato@berkeley.edu |

B. Sponsorship

| | | | |
|-----------------------------|--|------|-----------|
| Sponsor Name | EDW - Erin Gore | | |
| Sponsor Signature | | Date | 3-31-2011 |
| Sponsor Names | Student - Harry LeGrande Student – Cathy Koshland | | |
| Sponsor Signatures | | Date | 3-31-2011 |
| OE Program Office Signature | | Date | |

C. Give the title of the resource

| |
|---|
| Enterprise Data Warehouse (EDW) and Business Intelligence (BI) Projects – Student Financial Statement |
|---|

II. PROBLEM STATEMENT/CASE FOR CHANGE

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

In April 2011, the campus will launch a major release of student data in the EDW that will allow analysts to provide information on the student experience – from admissions to graduation. This release will include applicant, registration, degree and graduation/retention data, but a critical component that will be missing is information about the student’s curricular experience, from the classes they taught to who was their instructor to the grades they received.

Without this information, analysts across the campus are piecing together data elements and creating shadow systems that allow them to better understand student demand, enrollment needs, curricular changes, and faculty workload. This information is even more critical as the campus invests in common good curriculum – reading & composition, foreign languages, and math & science common good courses – to better support an undergraduate’s experience.

This proposal is to incrementally build upon the foundation of the existing data in the EDW to integrate data from new source systems. Doing so will result in many benefits, including but not limited to:

- Improve data security, reliability and accuracy.
- Reduce data duplication and hosting costs of maintaining data in multiple systems.
- Simplify the data access request process by reducing duplicative data stores.
- Improve understanding of data by developing common definitions.

Provide easy-to-use BI tools to produce reports and dashboards to:

- Facilitate quick development of ad-hoc reports to meet the growing campus analysis and visualization needs.
- Save analyst time by minimizing the need to integrate data locally, developing complex metrics once and reusing them and making ad hoc report creation simple.
- Improve quality of campus analysis by exposing data descriptions (metadata), using consistent calculations and certified reports.
- Allow users to start at the high level, identify exceptions/issues and drill down to the critical detail for improved response.

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

The project below is also included in other OE initiative proposals. We will coordinate with the OE program office to ensure the proposals are in synch and all inclusive.

The OE Student Systems Initiative team has identified the need for a web-based application that would consolidate all the fees, financial aid, and payments for a student. This web-based application would have the following features:

- It would display a real-time status of students’ financial activity, and would provide sufficient up-to-date details to help students understand what actions may be expected of them.
- It would provide a simple process that allows students to grant authorizations to release selected information to parents and others, who would then be able to use a secure logon to access student financial activities between monthly statements. This will allow parents to better assist with applying for financial aid and paying for educational expenses.

Staff would be able to go to one place to access all information pertaining to their respective roles in order to obtain meaningful and timely student account details and transaction reports.

Under direction from the Institutional Data Council, the OE Student Services Initiative and the OE Faculty Head, we are recommending the following complimentary and critical project:

Adding and integrating the following major groups of data to the Enterprise Data Warehouse (EDW) :

- Registration Fees, Housing Fees
- Financial Aid, Work Study, Student Awards
- Accounts Receivable / Accounts Payable
- NOTE: Initially, the data integrated in the EDW will NOT be real-time. The data will be updated nightly and real-time updates can be considered as a future project.

Development of new OBIEE Cal Answers dashboards and reports will be created for faculty and staff which will help:

- Evaluate fees, aid/awards and payments for a student or groups of students (by major, ethnicity, gender, etc)
- Evaluate trends in fees, aid/award and payments for students and groups over time

C. Describe the alternate approaches you evaluated in the process of developing this proposal and why those alternatives were not selected.

- Maintain status quo. Each office functionally responsible for financial data would continue to administer and display data on separate web sites. To minimize the confusion related to timing, the web sites could be coordinated to update on a set schedule. Students would contact the offices for assistance. Rejected because:
 - Maintaining multiple web sites is inefficient and costly.
 - Does not address the expectations for real-time information all in one place.
 - Does not help students understand their overall financial picture or provide sufficient indication of needed actions.
- Expand BearFacts to provide the desired additional financial information. Rejected because Campus IT plans to replace Bear Facts with the portal due to outdated technology and unreliability.
- Expand current vendor services provided by Sallie Mae Business Office Solutions or utilize another outside vendor. Currently, Sallie Mae Business Office Solutions hosts student monthly e-bills and manages the process for parents to view bills. Data elements can be expanded and provided more frequently to Sallie Mae or another vendor in this market space. Rejected because:
 - Students and parents are not satisfied with the current display and functionality.
 - The campus may need to compromise on the desired capabilities of the final solution if constrained to capabilities provided by the vendor.
 - The campus would have less control over defining and prioritizing enhancements as needs change.
 - Costs may be prohibitive in a real-time, transaction-laden environment.
 - Data is not integrated into the campus financial information, making it difficult to easily integrate the support of the students into campus and departmental financial reporting and modeling.

III. 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

Continue to build reusable essential core components that will make adding new subject areas to the EDW more efficient. Provide easily-consumable data, reporting and dashboards to enable user efficiency. The efficiency gains will result in a better use of staff time that focuses on analysis, instead of data collection and clean-up and will provide more comprehensive analysis of data for campus decision makers. This will be accomplished through:

- Consistent and reliable certified data means less time validating data sources. The data integration and report work can be performed once and continually utilized by all.
- Improved accuracy of published data through certification of data, metrics and reports.
- Improved analysis and time savings by developing reports and dashboards that identify data exceptions and support drilling down into data for further analysis.
- Faster development of ad hoc reports by analysts through easy-to use tools and pre-built reports and metrics. This enables campus decision-makers faster access to ever-changing business questions.
- Automated workflow to seek access to EDW data, reports and dashboards. Consolidating data for reporting makes data access management easier to administer.

Shadow systems for data collection can be reduced and eventually eliminated as campus users see missing data added to the EDW and trust its accuracy. This is a hard savings of infrastructure and time in addition to improving data security on campus by reducing access points and focusing resources. The IDMG found numerous shadow systems on campus that require some infrastructure, but lots of time in cleansing and integrating data sets. By performing this work and exposing it in the EDW, time is saved all over campus.

Instill a culture of continuous improvement that leads to high quality performance and outcomes. Easier and more powerful access to integrated campus data will encourage greater use of data and more analytical thinking, driving a culture change rewarding factual analysis and devaluing anecdotal assessment.

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

The Student Services OE Initiative is depending upon the EDW/BI solution in support of the student financial statement.

C. Identify the risks of not implementing the solution.

- Consolidating student financial information was expressed as a high priority across all student profiles during the OE assessment phase. It came up consistently in student and advisor focus groups, surveys, and other input opportunities. Failure to deliver a solution that is in such high demand and will impact every student on campus would jeopardize the integrity of the OE effort.
- Students will be confused about where to go to review their financial activities with UC Berkeley, and what, if any, action is expected of them. Parents will continue to struggle with the complexities of the existing financial web sites and applications. They will continue to encounter difficulties in accessing their children's' billing, payment and award disbursement activities between monthly statements, and so will be less able to help their children to prepare for and meet their financial obligations.
- Students and their parents may view the campus's lack of value on student services as contradictory to their own values and demonstrate their displeasure by withholding financial gifts or disparaging the campus's reputation. Many Berkeley students have siblings attending other schools who place a more concerted emphasis on overall student satisfaction and comparisons are made constantly.
- Staff will continue to encounter difficulties in working with the legacy systems that provide student financial information. Staff must access the back-end systems directly (rather than through a web interface) to gain information about a student's financial situation, using multiple systems, various screens, and many log-in IDs. Synthesizing the data to identify the source of a problem is cumbersome and time consuming, if they can even access it at all.
- Forestalling the replacement of the back-end systems introduces risks that the portal may not be able to provide the necessary information for the campus to execute core business functions, such as billing, maintaining cash-flow, registering students, etc. Because the current systems were installed more than 20 years ago, the technology is obsolete and finding qualified programmers with the skills necessary to keep the systems running, let alone enhancing them, is an ever increasing challenge.

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

This is a campus-wide solution that will benefit campus staff, faculty, researchers, and executive-level administrators. It will increase their ability to easily access consistent established answers derived from integrated campus-wide data. It will reduce the time spent by analysts integrating, validating, and cleaning-up data, and free them to spend more time on value-added work. Everyone making decisions on campus will be working with more accurate and consistent data, reducing doubt created by inaccurate and/or conflicting data, and reducing time wasted by such. Examples are UC Berkeley's cabinet (viewing financial trends), Advancement (more revenue for fewer dollars spent), students (student, department and UC trends) faculty (student and teaching trends), staff (integrated data from finance, student, HR, advancement etc.)

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

This project will be a combined effort of input and resources from: The Office of Planning and Analysis (OPA), Equity and Inclusion, Graduate Division, Admissions & Enrollment, Registrar’s Office, OE Student Services Initiative, Financial Aid Office, Controller’s Office and Information Services and Technology (IST).

Campus analysts and management representing the breadth of campus groups using the data under development will be included in data requirements, report and dashboard design and QA testing to ensure the deliverables are meeting the requirements of the campus.

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

The EDW will become essential as a source of reliable data on which to assess current and future projects. It will be able to provide the reliable data needed for meaningful cost-benefit and performance analysis, and establishment of baselines. As other data-driven initiatives emerge they will benefit by the existence of the EDW foundational subject areas. As more and more data is added, people will increasingly rely on it to answer cross functional area questions rather than copying data and looking for the needle in a haystack. Over the long-haul, it could well prove to be the campuses biggest cost savings project.

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?

Utilizing OBIEE Cal Answers as the primary student financial reporting platform for the campus will reduce the load on staff in academic departments who currently maintain reports which are based on the multiple operational systems which track student financial information.

Current systems displaying financial information to student services staff are:

- Department Student Awarding System (DSAS)
- Graduate Division Awarding System (GLOW)
- Financial Aid System (myfinaid)
- Human Resource system (HCM)
- Campus Accounts Receivables System (CARS)
- Bear Facts (Registration fees, residency, enrollment status, blocks)
- In-house department tracking/shadow system
- BFS Accounts Payable
- Glacier (International student tax withholding)

While most of these systems could not be eliminated, the resources to support these systems could be used more efficiently (i.e., less training, less time to gather data, etc.) if the departmental staff user shifted to a web display for both managing and reporting on student financial information.

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

| Profile/Impact in hours | Current Workload | 1-time workload requirement | Ongoing workload requirement |
|-------------------------|-----------------------|--|---|
| Student | None | None | None |
| Staff | Run reports as needed | Training, requirements and testing if on project team. Online training is estimated at 2 hours for general users and an additional 4 hours of classroom time for advanced ad hoc users. | Estimate 5% efficiency gains for moderate users. Estimate 5-10% efficiency gains for frequent users of student, procurement, HR and/or financial data. |
| Faculty | Run reports as needed | Training is estimated at 2 hours for general users | No change - run reports as needed |

IV. 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*).

General Deliverables for All EDW Projects

- **Project Phases** - Projects will be broken up into small deliverables over the length of the project to better enable course correction of deliverables.
- **Data** - New data will be integrated with other subject areas in the enterprise solution allowing cross functional analysis and a consistent cross-campus view. Detail and summaries will be made available to support campus needs. See section 4C for details.
- **Reports & Dashboards** – New development for reports and dashboards will be performed in OBIEE Cal Answers. This solution will deliver certified and re-usable metrics that will measure goal achievement. It provides faster ad-hoc reporting development for campus analysts and drill-down capabilities for all users.
- **Security** - Utilize the recently deployed and flexible EDW security model to meet the expanding data security needs of the campus. Provides information that people need while protecting sensitive data.
- **Metadata** – Capture business and technical metadata and expose through reports and in mouse rollover in OBIEE Cal Answers.
- **EDW Access Request** – For all new data, work with the Identity Management team to utilize the EDW Access Request system, a web-based workflow that assigns security roles based on data proprietor approvals.
- **Tool Training** – Create online training for the OBIEE tool. Create online and classroom training for ad hoc report development in OBIEE.
- **Subject Area Training** – Create online and classroom training for new data, reports and dashboards. Provide tier 1 training to the Service Desk.
- **EDW Support** – Develop a Service Level Agreement (SLA) which defines roles, responsibilities, and processes related to ongoing support of the EDW and BI services.

General Constraints for All EDW Projects

- **Funding** – Project work can start when one-time work is funded and a source of ongoing funding is secured.
- **Project Resources** – EDW/BI projects require a great deal of time in concentrated blocks from data proprietors, functional subject matter experts and technical staff. External project teams will be utilized as much as possible to staff EDW projects and backfill or provide functional and technical expertise, but dedicated oversight is required by both functional and technical leads.

Student Financial Statement Deliverables:

- **Web Services / Messaging Development** - Work closely with IST-Application Services staff to develop a solution that efficiently supports web service and ETL development which provides the functionality sought by the student portal stakeholders.

Student Financial Statement Constraints:

- Current back-end systems lack capacity to handle and supply data in a detailed and timely manner.
- Real-time data in the EDW is dependent upon web services and messaging busses to provide the technical architecture.

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.)

Student Financial Statement

| Milestone | Responsibility | Timeline |
|--|--------------------------|---------------------|
| Project Funding Approval | | |
| Identify source systems, and determine if any system replacements should be completed prior to designing interfaces to portal. Replacement requires separate project plan. | Functional Teams and IST | Month 1 – Month 3 |
| Functional/data requirements, source system analysis, business definitions, | Functional Teams and IST | Month 3 – Month 6 |
| Technical and data architecture; technical specifications | Functional Teams and IST | Month 4 – Month 9 |
| Development: ETL, data interface, workflow, security model, web services/EAI. | Functional Teams and IST | Month 5 – Month 11 |
| BI and Metadata Development | Functional Teams and IST | Month 7 – Month 12 |
| QA and User Acceptance Testing | Functional Teams and IST | Month 13 – Month 14 |
| Training Development & Implementation Service Desk Support | Functional Teams and IST | Month 12 – Month 14 |
| Roll-out to students | Functional Teams and IST | Month 15 |
| Project Assessment | Functional Teams and IST | Month 16 |

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

| |
|---|
| <p>Source System(s):</p> <ul style="list-style-type: none"> • Department Student Awarding System (DSAS) • Graduate Division Awarding System (GLOW) • Financial Aid System (myfinaid) • Human Resource system (HCM) • Campus Accounts Receivables System (CARS) • Bear Facts (Registration fees, residency, enrollment status, blocks) • In-house department tracking/shadow system • BFS Accounts Payable • Glacier (International student tax withholding) • Metrics include unpaid and paid charges, pending and paid awards/aid, payments made for bills and selected cash purchases, refunds, calculated totals, and security roles and authorizations. |
|---|

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

| |
|--|
| <ul style="list-style-type: none"> • Additional database storage • DBA participation to create tables, views, and performance tuning activities. • Enough machine power to support additional faculty and staff users. • Additional software licensing costs for new Enterprise Application Integration tools. |
|--|

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

| | RISK | MITIGATION PLAN |
|----|--|--|
| 1. | One Time and Ongoing Funding | Seek OE one-time funds. Seek incremental ongoing costs from common good funding. If common good funding is not available, the funds allocated for enhancements will be utilized for baseline support until common good funding is secured. |
| 2. | Functional and technical resources are not | Hire outside consulting to fill in gaps in skill set and resources. |

| | | |
|----|--|---|
| | available and/or skilled. | |
| 3. | Campus resists using a new BI tool (OBIEE Cal Answers) | Curriculum design including the development of online and facilitation of classroom and drop-in training is essential. Developing support from change leaders who will utilize the certified reports is equally essential. |
| 4. | Expectation Management / Project Management | Existing EDW management can concurrently oversee 2-3 large projects. Given the perceived campus demand, the EDW projects include extra management support (project management, technical leadership). |

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

Each project will have a Project Manager, Project Sponsor and executive EDW Sponsor who will oversee the work effort. The project plans will be developed with milestones to ensure the data deliveries and basic report deliveries are on track.

v. CHANGE MANAGEMENT

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

- Strong communication plan through list serves, updated websites, consistent updates on progress of projects and marketing quotes from thought leaders.
- Development of a solid training program: Forums to prepare the campus. Online, Classroom training for the tool AND the data and drop-in workshops. Advanced training for ad-hoc report development.

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

- The ease of obtaining information will be incentive for students, parents and staff to use the system.
- Free use of the tool and actionable metrics will be incentive for campus decision-makers and analysts to use OBIEE reports on student financial data.

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?

- Senior management (for reviewing certified OBIEE reports)
- Financial Aid and Scholarships Office
- Graduate Division
- Billing and Payment Services
- Registrar's Office
- Student Affairs Officers in campus departments
- Portal IT developers
- Portal owners
- Programmers of feeder systems (CARS, URIS/Registration, ProSAMS, etc.)
- IST Web Services/Enterprise Application Integration developers
- IST Data Warehouse/Data Integration developers

VI. 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.

This proposal has been developed with fully-costed estimates.

Partial funding of the following individual projects is possible by limiting the scope of data sources incorporated into the EDW. Based on input from functional owners and IST, the IDC would prioritize the data to be incorporated into the EDW.

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

The EDW/BI function is seeking common good funding to cover the incremental ongoing costs for approved projects.

- C. Please download and fill out the OE Resource Request Budget Template located at [location] and follow the instructions on the first worksheet in the workbook to complete the budget and line descriptions. Include both completed sheets with the Resource Request.

VI. ASSESSMENT PLAN

Please use the table below to detail your metrics.

| METRIC CATEGORY | SPECIFIC MEASURE | MEASURE BASIS | DATA COLLECTION METHOD | DATA COLLECTION FREQUENCY | FUNCTIONAL OWNER OF DATA COLLECTION | LARGER GOAL TO WHICH METRIC RELATES |
|--------------------------------|--|---------------|------------------------|---------------------------|-------------------------------------|-------------------------------------|
| FINANCIAL PERFORMANCE | | | | | | |
| 1 | Staff and Student Time Savings through use of Student Data | Project | Survey | Annual | OSRCS | |
| | | | | | | |
| OPERATIONAL PERFORMANCE | | | | | | |
| 1 | # Reports Run for Student Data | | OBIEE Stats | Monthly | IST EDW | |
| 2 | # Users for Student Data | | Database Stats | Monthly | IST EDW | |
| | | | | | | |
| CUSTOMER SATISFACTION | | | | | | |
| 1 | Data Accuracy, Reliability | Project | Survey | Annual | OSRCS | |
| 2 | Student Report Benefit | Project | Survey | Annual | OSRCS | |