OE RESOURCE REQUEST APPLICATION

University of California, Berkeley

I. SPONSORSHIP

A. Initiative

Initiative	Student Services		
Initiative Manager	Anne De Luca		
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B. Sponsorship

Sponsor Name	Anne De Luca, University Registrar		
Sponsor Signature		Date	
Sponsor Name			
Sponsor Signature		Date	
OE Program Office Signature		Date	

C. Give the title of the resource

Designing State of the Art Academic Planning and Registration Tools

II. PROBLEM STATEMENT/CASE FOR CHANGE

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

1. **Lack of consolidated information and tools for academic planning and registration is a barrier to student achievement and creates dissatisfaction.** The recommendations of this Academic Planning and Registration Services proposal respond to what students have been telling us for years: we need to simplify and centralize the tools and information used for academic planning and registration. Currently students must open 6 or more different web applications, toggling back and forth, just to get the minimum information required to register for classes. Furthermore, students tell us making sense of the complicated web of requirements, restrictions and policies is daunting.

Perhaps most disappointing for our current generation of students is the University's failure to provide them with the information and tools they need to build meaning in an individual context. They can't leverage the experiences, positive and negative, of thousand of others who have gone before them. Every time a student joins a program or plans a schedule it's as if he or she is the first student to ever embark on such a journey, leading to repeated struggles and failures that ultimately affect UC Berkeley as an institution, as much as the students themselves.

Our students work incredibly hard and contribute greatly to the scholarship and research that make Berkeley a world-class institution. They deserve an administrative infrastructure that gets out of their way, and provides them with the tools and insights

to achieve their maximum potential during their tenure as students. If this weren't enough of a reason to fix our broken processes, we know that our students are second only to the federal government in financial support of this University. It is therefore more important than ever for decision makers to demonstrate concern for the student experience, and to respond with positive action to the feedback they give us. And finally, how we treat our students affects their lifelong relationship with the University. As the research on alumni giving has shown, "the single biggest determinant of the generosity of alumni donations is satisfaction with one's undergraduate experience." *Source: "Patterns of Giving to One's Alma Mater Among Young Graduates From Selective Institutions" 2003*

2. **Use data collected about student activities and intentions to improve institutional planning, performance, and accountability.**
Class scheduling and curriculum planning is currently done in a *reactive* manner, requiring significant administrative overhead for managing supply and demand *after* students sign up for classes. Faculty, advisors, and schedulers must review & adjust class rosters, wait-lists, add/drop requests, while students experience a similar administrative burden in reacting to the adjustments in class sections offered and seat availability.

By collecting the necessary information and applying the appropriate tools, the curriculum planning process can shift in nature from reactive to *pro-active*. Academic departments and student service providers should be planning and providing curriculum and services to students based on holistic and empirical views of the data. As a university we're being asked to do more with less. We've cut department budgets and increased the student body. Departments must be held accountable how they use limited instructional resources. But they can't do this without good predictive data that is timely, accurate and easy-to-consume. We need to help departments understand which courses students need, and want, to take in order to ensure that we offer the courses most sought and with the greatest educational value, and that we don't spend precious teaching resources where there is little interest or need.

Students want to have a more meaningful academic experience, gaining time to either explore the academic content that interests them or to graduate earlier. They should leave Berkeley satisfied that we provided them with the best possible curriculum as well as the opportunity to take greatest advantage of it.

3. **Replace unstable and unsupported components of the class registration system to mitigate risk of system failure.**
The current system responsible for registering all students on campus hinges on an outdated, and unsupported component called Periweb. This software is responsible for the crashes experienced during almost every registration period. We hoped, over 3 years ago, when we invested as a campus in Kuali Student (KS) to have a new enrollment system by now. However, the KS project hasn't yet begun to develop its proposed enrollment system, and even if everything goes as planned, it will be another 5 years before we could have such a system up and running at Berkeley.

The prospect of doing nothing to address the risk of system failure while waiting 5 years for a wholesale registration replacement is both financially and operationally dangerous. We are routinely spending close to 75K annually, on top of the normal costs of running registration, just to manage the instability and crashes caused by this outdated software. This doesn't account for disruption and wasted time experienced by students and staff when the system doesn't function properly. Finally, the biggest risk is a large-scale system failure. We have one guy on campus who understands how this thing works, there's no-one from the outside we can call for help, and if we can't register our students the contingency plan is straight paper. We would literally be thrust back to an era of registration before punch-cards.

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

Provide students with UC Berkeley endorsed **academic planning tools within 3 - 6 months**, either via a partnership with a proven vendor solution (borrow), purchase of an off-the-shelf application (buy), or by commissioning an academic planning application (build). The academic planning application will address our students' needs by supplying **integrated data views within an outstanding UI** and will continue to delight students by incorporating new functionality every 3-6 months.

Simultaneously, **replace the unstable portion of the registration system** and position the campus to provide students with feature-rich registration services built on scalable, secure and stable infrastructure. **Prepare for wholesale replacement of registration mainframe** system within 5 years. Develop web services infrastructure that will lay the foundation for **better data integration and more innovative & rapid application development** across campus. In addition to supporting academic planning

and registration services, this **common-good services infrastructure** will profoundly benefit academic advising services, the student portal and academic commons, campus-wide planning and analysis/enterprise data warehouse, mainframe retirement, curriculum management tools and a new online catalog.

1. Make basic Academic Planning & Registration Tools available immediately
   a. **Conduct a feasibility study on the most expedient path** to providing students with Academic Planning & Registration application
      i. If best option is to partner: negotiate collaborative engagement plan and contract with vendor including overall 5-year vision, milestones, costs, timeline, deliverables, periodic reviews and evaluation, and relationship termination terms and conditions. Develop an Electronic Data Exchange Agreement between UCB and vendor (non-sensitive data)
      ii. If best option is to buy or build: procure software, contract UI and UX team (consultants), define requirements, deliverables, and deadlines.
   b. **Quickly provide students the following new functionality** backed by official UCB data and accessible through the emerging Student Portal:
      i. Integrated course/class schedule view
      ii. Class schedule builder & ability to share the schedule with advisors/peers
      iii. Academic Planner (4-year and 2-year)

2. **Collect/capture more UCB course information** and make it accessible to students through Academic Planning & Registration application
   a. Data from the class syllabus
   b. Non-sensitive, student-to-student portions of online course evaluations
   c. College breadth requirements
   d. Undergraduate degree requirements

3. Provide APIs/Web Services that will:
   a. **Replace manual data entry, flat file feeds and materialized views** to the Oracle tables to more efficiently provide campus departments with data to **support existing business activities**, e.g. maintaining department web sites, reporting and analysis
   b. **Support innovation and new development by departments,** service providers and students, e.g. integrated views, mobile applications, rapid releases of new tools and information hubs responsive to students changing needs and expectations
   c. **Support Berkeley students in Academic Planning and Registration** activities as well as the larger umbrella of Student Portal Services

4. Make additional **interactive** academic planning and registration tasks available. Provide students **one place for all registration -related information and transactions.**
   a. If using partner-option, develop a contract with vendor that includes development of new modules that will contain sensitive student data
   b. Allow students to track their progress by **running a degree audit report from Academic Planning & Registration application**
   c. Add ability for a student to pick her classes for the next term and **register for those classes from the schedule builder**
   d. Integrate course, class, schedule, enrollment, course program and degree audit data in the Enterprise Data Warehouse and **develop certified reports and dashboards to provide critical answers for campus decision-makers**.

5. **Stabilize UCB's back-end course registration system**:
   a. Replace the TeleBears UI and the Periweb middleware components of the registration system with Berkeley-built web services (one for enrolling students in courses, one for waitlist management, and one reckoning payment and census status), thereby eliminating the unstable components and mitigating complete failure of the registration system.
   b. Allow the user-facing Academic Planning and Registration application to continue to interface with the existing mainframe DB2 databases via the Berkeley web services. Be well-positioned to replace the mainframe after 5 years with either:
      i. Kuali Student Enrollment
      ii. A commercial Enterprise Resource Planning (ERP) vendor solution

iii. Another, better open source or 3rd party solution that has yet to emerge

This course of action quickly solves the extreme risk posed by our unstable registration system and it improves the student's user experience. It's cheaper than the alternatives, a.) continue to triage & patch up unstable and unsupported system for next 5 years and risk massive system failure or b.) buy and implement a vendor ERP system today (est. cost 30 mil.) Furthermore, because of the need to recap ROI, the ERP option precludes the possibility of moving to Kauli Student **or any other open source** solution for at least a decade.

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

1. Vendor ERP Solution:
While we propose taking advantage of existing non-ERP solutions that may be more quickly, easily and much less expensively implemented in the near term, an ERP solution should be considered for the longer term. We recommend that Berkeley perform a feasibility study to determine if a vendor ERP solution could be implemented in the mid-term (next 3 years) to long-term (4+ years) and compare that solution to alternatives (KS and or other open source solutions). The feasibility study should take into account the following considerations:

- **ERP Solutions -** Since PeopleSoft's Campus Solutions and Sungard's Banner are currently implemented at other UC campuses, we are narrowing our feasibility study to these 2 solutions.
- **Hosting Options -** Evaluation of costs/speed to implement if an ERP solution is hosted by the vendor and/or in partnership with other UC campuses. We will not consider hosting the ERP solution for UCB only.
- **Cost Comparisons** - When the IST Director of Application Services investigated a PeopleSoft Student implementation in 2003, the estimated cost was $17-30 million ($17M for acquisition/$1-10M for implementation)**.** The cost of administration including customizations and training - one time and ongoing - needs to be forecasted as part of this analysis. The total costs need to be compared to alternative options.
- **Speed to Implement -** We need to evaluate the implementation options to determine if it's feasible to implement an ERP solution in the mid-term (before 2014) or long term (after 2016) in comparison to other alternatives (KS or other open source solutions).
- **Functionality** - An ERP solution will contain many modules. The project team will need to perform a fit/gap for the functionality that is required by UC Berkeley. In addition, because ERP's are costly to customize, users are typically pushed to compromise on how well the product meets their unique business needs in order to keep the cost down. This usually results in frustrated and dissatisfied users
- **User Interface (UI)** - Most universities find the PeopleSoft and Banner UI's lacking and additional training support is required.

2. Kuali Student Solution: Some of the functionality outlined in this resource request is scoped to be developed by the Kuali Student (KS) consortium. UC Berkeley is a founder in the KS consortium and has invested significant resources toward the development of this open source student systems software. It's important to note that all Kuali Student development to date has solely been in the area of curriculum management, and that development of Kuali Student Enrollment (which includes academic planning, registration and student records functionality) isn't scoped to begin until fall 2011.

Therefore, the Kuali Student product is not a viable solution for our immediate problems and risks. KS-built functionality will not be available for the campus to begin implementing until well after 2014. Implementation will take at least two years. Thus, simply waiting for Kuali Student would put the campus at 2016 before any improvement in the academic planning and registration process could be experienced by students, staff and faculty. Furthermore, even if we could wait 5 years to improve the user experience, which we can't, our legacy registration system is precariously close to failing, posing a huge risk from the perspectives of both operational stability and student service.

Finally, as much as we believe in the KS vision, and are dedicated to its success as both an open source software solution and as an institutional consortium within higher education, it is clear that we cannot proceed with the assumption that KS is our *only* option. Kuali Student development has historically taken significantly longer than planned. The scope of functionality delivered in KS Release 1 has been radically reduced though the product was just released to the public on March 7, 2011, a full 2 years after the original release date. Also, KS is in its embryonic stage of product development and has never been tested in any university production environment**.** Since Kuali Student software has never been implemented by any institution (UCB will be the first to bring some KS software into production, planned for fall 2011) it is risky to bank on its ability to solve our complex and rather urgent registration problems. We believe Berkeley would do well to take a more conservative and iterative approach to solving the academic planning and registration challenges on campus, and hopefully, in the years to come, take advantage of a more mature and proven Kuali Student product.

A little more information on a key component of the option we are recommending: Non-ERP Solutions
In the spirit of doing more with less and beginning to fix the problems now, we conducted a market research study of non-ERP solutions. Our research indicates that the higher education technology market is evolving rapidly, not only for collaborative learning tools but also for administrative services that support learning. Many of the rapidly growing start-ups of late have

humble beginnings on college & university campuses but grew their business and are now considered attractive investments for philanthropic and entrepreneurial investors. There are several products which offer academic planning & registration functionality superior in performance and student experience than anything the University currently has to offer.

The table below compares some of the leading non-ERP academic planning applications in use among university students. Our proposal is to pursue the options below in order of the best quality, quickest to implement and cheapest first.

III. IMPACT AND STRATEGIC ALIGNMENT

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

1. Capturing more precise information leads to better planning which results in less administrative overhead. This initiative creates value in the domain of teaching and research by capturing students' academic plans earlier and with more detail than is currently possible. This data will help departments plan what courses to offer with more economy and precision and to more easily plan faculty teaching commitments.

In today's environment **we have no way of knowing** from term to term if 50 or 500 students are planning to register for Integrative Biology 132L or Japanese 10A. The Registrar's website lists over 115 impacted courses across 30 departments. The issue of impaction is a sore point among students, staff and faculty, especially in this era of budget cuts and tuition increases. This proposal allows the campus to leap forward in it's ability to properly plan and schedule the right mix of classes that will **satisfy student needs and expectations**, and **support time-to-degree**. We address this problem by building web services that will deliver both hard data (missing requirements derived from the degree audit system and advisor-approved student schedules from the online schedule builder) and soft data (student desires and intentions reflected in their 2 and 4 year academic plans) to the EDW and from there directly into the hands of faculty and staff curriculum planners. This information will be aggregated in one place, in an **easily accessible and understandable format** that will **liberate faculty and their department staff** from dependence on

technical middlemen when trying to get critical planning data.

2. Reducing paperwork and the elapsed time to process transactions creates operational efficiencies for both students & staff.

- We will reduce student time spent waiting in lines with paper forms requesting course schedule approval and advisor codes
- We will eliminate the processes of managing college breadth requirements in shadow databases and make that data easier to access.
- The staff time spent updating departmental databases, spreadsheets and web sites will be streamlined as we move towards a "once-and-done" business culture. Currently the *same data* is manually entered or painstakingly uploaded in complicated individualized feeds, *over and over* by academic departments, schools and colleges, the Graduate Division, the Registrar's Office, the Office of Planning and Analysis, the Academic Senate and others. By instituting the principle "once and done", supported by web services and well designed UI's, the effort to input data is expended **one time only** after which the data, understood as a campus community asset, is conveniently available to be used by anyone on campus with a legitimate need for access.

3. Providing student-consumers with better information and options for planning and choosing courses and instructors promotes a culture of high quality performance. This in turn will increase demand for high-quality courses and reduce demand for under-performing courses.

4. Iteratively implementing our proposed solution embodies a culture of continuous improvement toward high quality outcomes. Our project is chunked in 4 phases, each with **tangible and useful** deliverables. Funding can be allocated incrementally and continued based on measurable results. Our development process will be user-driven and our web-services platform strategy will lower the barrier to other individuals and departments on campus who are also motivated to make things better.

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

1. Delighting and satisfying students and parents leads to increased alumni giving. There is plenty of empirical and anecdotal evidence supporting the idea that positive and negative experiences experiences outside of the classroom may influence the choice to give back to one's alma mater. (For one discussion, see the Chronicle of Higher Education at http://chronicle.com/forums/index.php/topic,70993.0.html)

2. Decrease time to degree. More informed students are also better academic planners which can result in faster time-to-degree.

3. Maintain Berkeley's competitive position and desirability for potential students. As Berkeley's tuition increases to $31,534 for residents and $54,412 for non-residents, we're nearing a cost/benefit threshold where we can no longer claim to offer an Ivy education for a fraction of the cost. Although our current pool of applicants and our yield still boast our position as the number one public university, we would be proceeding with tragic hubris to believe that position to be invincible. Addressing our long standing under-investment in student services and student systems is a sure way to hedge against our rapidly slipping position as the low cost option for a superior education. Students and parents who pay top dollar expect top service and top value in the total student experience.

4. Outshine the competition. Stanford, UCLA and USC will vie to emulate Berkeley's approach to supporting students in academic planning and registration. Berkeley will be lauded by peers and professional organizations as a progressive and responsive innovator in the field Enrollment Services.

C. Identify the risks of not implementing the solution.

1. Failure of the registration system. Our greatest risk is that the core of our registration system is based on software originally purchased to support telephone registration, and later modified to support online registration. This software product is not longer supported by any vendor. In fact, the company that built it no longer exists. There is one Berkeley employee with the expertise to keep the system running. Thus, the successful registration of 25-thousand students per-term hinges on the good health and standing of one individual. Should our registration system fail, the wheels of the university will come to a grinding halt. There is no back-up system. Our only alternative is to manually register each student. The cost of staffing such an effort, and managing the months of repercussions for other systems and business functions will run into the millions. Berkeley's reputation will be severely compromised and such a debacle will surely erode even further public confidence in UC Berkeley's administration.

2. Risks on not building web services: Continuing on our current path of adopting a pre-services technical architecture will make it very **hard on operations and users when we do replace the mainframe.** At present, most campus applications access enterprise data via multiple materialized data views that are developed and customized for each specific application. This approach is extremely inefficient, expensive, inflexible, and poses a security risk as it requires:

- labor to maintain countless customized data views
- labor to establish and maintain batch processes currently used to integrate systems
- infrastructure and labor associated with multiple data stores for the same data
- potential costs of security breaches which are made more likely when sensitive data is duplicated across multiple campus systems and managed by many IT staff with varying degrees of security expertise

Migration to a service oriented approach for data integration will **mitigate these risks** and **significantly reduce costs.**

3. Risks of trying to solve the immediate problems with other solutions such as Kuali Student or an ERP system. First, there is no Kuali Student Enrollment System. It hasn't been build yet, let alone tested, and as mentioned before, the soonest possible date it *could* be in production on campus would be FY 2016. In terms of going with an ERP solution, it's financially prohibitive (est. cost 30mil) and would also take too long to implement (FY 2013/14 if we started *today*) leaving us with a good deal of student dis-satisfaction for years to come. Furthermore, the costs and risks are too high to rush any potential solution and the critical state of the registration system is too unstable to wait. We MUST proceed with quick wins while we evaluate the large investment and functionality trade-offs required for a potential ERP implementation be it with a commercial vendor or an open-source solution such as Kuali Student. A feasibility study is required to assess the trade-offs and alternatives for the long-term solution.

4. Weak position as UCOP moves towards common systems. As UCOP intensifies it's efforts to drive to common systems, inaction or a tepid response to our current enrollment-related problems will ensure that Berkeley has the least amount of clout at the collective UC table, not only behind major competitors such as UCLA and UCSD, but also falling short of schools like UCSC and UCD who at least have modern, well-oiled ERP enrollment systems in place.

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

The benefits of the approach laid out here are many-fold:

- Mitigates the risk of complete failure of the registration system
- Dramatically improves the experience for students and academic advisors
- Builds an enterprise services infrastructure which supports all future enterprise systems development, regardless of platform
- Provides increased access to data for the campus community to be used for predictive planning and continuous improvement

This value is delivered to end-users in regular intervals over the course of thirty-six months. Because of the phased and iterative development cycles, students and advisors will experience immediate and ongoing improvement as they use the academic planning and registration tools.

Specifically, the following constituents will benefit:

1. **Students**. Students (grads and undergrads) are the primary beneficiaries. The complicated and frustrating web of information students need to make optimal registration decisions will delivered to them in one easy to use application. The student experience will go from bad to good to great as this project unfolds.
2. **Academic departments.** Decreases administrative burden, increases access to data.
3. **Faculty.** Increases faculty understanding of student curricular expectations and preferences and provides instructors the ability to communicate the value of their course offerings, i.e., faculty can use the Academic Planning application to market their classes.
4. **Office of Planning and Analysis.** Increases access to data that will help OPA better understand course attributes and enrollment demand, providing immediate **support for the Common Good Curriculum Initiative**, and general support for numerous other OPA activities.
5. **The University Registrar**. Eliminates whole processes and systems, decreases administrative workload, mitigates risk, strengthens security.
6. **Berkeley as an institution**. Better academic planning capabilities support a culture of continuous improvement. Increasing

student satisfaction will foster recognition of Berkeley a premier academic institution that is also a leader in the provision of superior student services.

7. **The UC System.** Supports our core teaching mission. Strongly positions Berkeley to be a leader in system-wide planning for streamlining business functions and student systems.

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

This is a highly collaborative effort. Using a combination of existing campus systems/technologies (the Student Portal (Sakai platform), IST Enterprise Services, the Enterprise Data Warehouse, the Degree Audit system, the Course Management System, the mainframe course and class systems) and external vendors and partners, we are seeking to leverage any and all useful systems that currently exist. We will capitalize on the strengths of existing systems, while embarking on the difficult work of addressing long-neglected infrastructure needs. All of these efforts will be employed in the service of operational efficiency and addressing the user experience to create an extremely useful and pleasurable environment for students to plan and execute their academic objectives.

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

This proposal addresses the most **urgent** and **risky** aspects of our registration system: the convoluted user experience and the unstable and unsupported registration middle-ware, Periweb.

The scope of this plan will by no means solve all of Berkeley's Academic Planning and Registration challenges. Its aim is to stabilize and fortify our infrastructure, while addressing the long-ignored needs of students, advisors and academic departments.. This proposal represents the first step towards the longer-term goal of fully replacing our legacy curriculum management and registration systems. The first three projects listed below could be considered as extensions of the work proposed in this plan. They are all critical building blocks for Berkeley to achieve the goal of providing world-class academic planning tools and registration services to our world-class students and faculty.

1. **Retire and Replace Mainframe Registration System.** The work outlined in this proposal will lay the foundation for wholesale replacement of the mainframe system with minimal disruption to business operations, academic services and the user experience. The lessons learned from decoupling the registration system user-interface from the back-end logic (with the help of a registration web service) can serve as a model for retiring the remainder of UC Berkeley's mainframe systems.

2. **Institute a Program Management system.** Incorporate structured degree program information and requirements into the new Course Management system to create a new, comprehensive **Curriculum Management** system for the University. Integrate program data (via API) with the new registration system to **execute and enforce rules and recommendations for students at the point of registration**.

3. **Replace the online General Catalog.** Serve prospective and undecided students by providing an interface designed for subject exploration & discovery as well as a mechanism for the campus to curate and feature the offerings.

4. **Development of applications to solve business problems in other contexts and on a range of devices.** This proposal provides a comprehensive plan for addressing the most critical student needs in the context of academic planning and registration. The infrastructure that this project will help to establish will lower the barriers to access for interested (& authorized) parties to meet other evolving needs as they arise. Colleges or departments could build apps to understand curricular commonalities/overlap between disciplines & trends of such relationships; class & enrollment data could be combined with facilities or other location-based information to inform energy usage and safety issues; the sky is the limit with how the information could be used if readily available.

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?

This proposed solution will affect a number of existing systems and processes. In certain cases, it will lead to retiring some systems and processes, and in other cases, it will positively re-engineer processes and improve the performance and usefulness of existing systems.

Systems that can be replaced and retired:

- College of L&S Breadth Requirement Database (Data will be entered centrally in Course Management)
- College of L&S Breadth and R&C Search Application (Data will be consumed by students in Academic Planning application and Course Management)
- Online Schedule of Classes (Data will be consumed in Academic Planning application and Course Management)
- TeleBears (the UI will be replaced by Academic Planning application, the back-end will be replaced by Web Services)

- Periweb: unsupported middle-ware which is critical for student enrollment (Will be replaced by Web Services)
- Mainframe Course System (Will be replaced by Course Management & Web Services)

Processes that can be replaced and retired:

- Paper-based process for approving student schedules and distributing advisor codes
- Production of the paper General Catalog
- Paper-based review of new courses to determine breadth requirements
- Manual tracking of class sections, instructors and enrollment information by Academic Department staff

Systems that will be improved:

*The **creation of enterprise web services** and a service registry will greatly improve and support all of these systems. They will have access to **more accurate** & **fresher** data, **more quickly** and from **more sources**. This data will in turn make it easier to support existing business functions, and especially, to rapidly, and much less expensively respond to future business needs as they arise.*

- bSpace/SAKAI (Berkeley's current Learning Management System)
- The Academic Commons/SAKAI (Berkeley's incoming Online Academic Environment including the Student Portal and Learning Management System)
- Course Management System*
- DARS (Degree Audit System)
- School, college and department owned applications, web sites and data bases
- Student Data Warehouse *(Significant addition of new data and supporting reports and dashboards)*

Processes that wi**ll be improved:**

- Academic exploration and decision making for students
- Academic planning for students
- Academic schedule approval and distribution of advisor codes
- Class registration
- Academic advising for students from long-term academic planning to detailed term schedules
- Process for determining breadth requirements and maintaining and distributing the data
- Department decision-making regarding which classes and number of sections to offer each term
- Process for updating course and program data, rules and requirements into the DARS (the degree audit system)
- Wait-list management and the add/drop process: better planned class offerings will result in more students getting into the classes they need

*Course Management System: This is a new system to be piloted summer 2011 and released into production in fall 2011. The Course Management system (CM) facilitates the creation, approval and cataloging of courses. It will replace the Academic Senate's paper course approval process, and offers students, staff and faculty a place to view all of the course information currently available in the online general catalog. Additionally, departments will eventually be able to use CM as a central repository for **all** course data, including that not required by the Academic Senate or currently captured in the online general catalog e.g. learning outcomes, program requirements, extended course descriptions. CM will provide the data input screens for collecting breadth requirements and other course data to be used in the Academic Planning and Registration system. CM also includes **faceted search** capabilities that allow users to search for courses and filter using multiple criteria such as key-word, department, units, course level, and requirements. The system architecture is designed to evolve over time, and to expand the amount of course-related information collected. Eventually, the Course Management system will evolve into a true **Curriculum Management** system with the addition of structured program data and rules, thereby fully replacing the online general catalog.

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**
Students time spent visiting numerous websites exploring courses and deciding on academic paths.	25,000 UG students x 3 hours x 2.3 terms = **172,500 hrs**	N/A	**115,000 hrs** *Aggregating and presenting data in one place in a user-friendly format will save students 57,500 hrs. per year (est. ⅓ decrease)* **Delivered incrementally, finishing in Phase 3, Fiscal Yr. 2013.**
Students planning their class schedule must visit at least 6	25,000 UG students x 3 hours x 2.3 terms	N/A	**86,250 hrs**

different websites to get the minimal information needed to plan a term schedule. Furthermore, there are no official UCB class schedule building tools.	= **172,500 hrs**		*Presenting all data (course, class, program requirements, & selected syllabus and evaluation data) in one place and providing academic planning tools will save students 86,250 hrs. per year (est. ½ decrease)* **Delivered incrementally, finishing in Phase 4, Fiscal Yr. 2014.**
Students required to get in-person advisor sign-off on proposed class schedule	15,000 UG students X 15 min advising appt. X 2.3 terms = **8,625 hrs**	N/A	**5,750 hrs** *Advisors say ⅓ of students wouldn't have to come in person if electronic approval were available, saving students 2,875 hrs. per year* **Delivered in Phase 1, Fiscal Yr. 2012.**
Students registering for classes (including the 3 week add/drop period) using the TeleBears application.	Ave. session time is 10 min. X ave. 21 logons per student X 25,000 UG students X 2.3 terms = **201,250 hrs**	N/A	**93,917 hrs** *Ave. session time will decrease by 3 min. b/c students will be able to **register directly from schedule builder** and not have to re-enter data on another website. Ave. log-ins will decrease to 14 because **better planning** by students and by academic departments will result in **fewer waiting lists and schedule changes**.* **Delivered in Phase 4, Fiscal Yr. 2014.**
Total Impact On Students	Total **554, 875 hrs** *Equal to 23,119 24-hour-days = almost one 24-hour day per student.*	N/A	Total **300,917 hrs** ***est. 46% reduction in time students spend** on academic planning and registration activities.*
Staff (academic advisors) time spent approving student schedules and **handing out advisor codes in person**	15,000 UG students X 15 min advising appt. X 2.3 terms = **8,625 hrs**	$0 if partner solution **$204k** if buy or build	**5,750 hrs** ⅓ of students who don't actually require in-person advising receive advisor codes electronically. **2,875 hrs & $130K savings** **Delivered in Phase 1, Fiscal Yr. 2011/12. Savings calculated at advisor staff rate $94K (includes benefits)**
Staff time (academic advisors) spent researching course and class information	4 hours X 500 advisers X 2 terms = **4000 hrs**	N/A	**2000 hrs** By aggregating all of the information into one, user-friendly format, the advisor will save ½ the time.

			2,000 hrs & $90K savings **Delivered incrementally, finishing in Phase 3, Fiscal Yr. 2012/13. Savings calculated at advisor staff rate $94K (includes benefits)**
Staff time (L&S Coordinator of Educational Policy) spent managing the manual process of breadth determination and maintaining a shadow database.	1 staff person works 3-4 hrs. per month on this. **= 40 hrs**	One time costs include the project expense of creating data entry screens & CM database integration for breadth data. = **$136k**	**5 hrs** Eliminates staff time spent maintaining shadow database. **35 hrs & $1.6K savings** **Delivered in Phase 3, Fiscal Yr. 2012/13. Savings calculated at advisor staff rate $94K (includes benefits)**
Staff time (L&S IT Lead) maintaining a web application allowing students to search on courses by R&C and Breadth requirements.	1 staff person works 1-2 hrs. per month on this. **= 20 hrs**	One time costs include building the breadth requirements web service/API. = **$40k**	**0 hrs** Integrating breadth requirements into the Academic Planning application will eliminate the need for L&S to maintain a separate website. **20 hrs & $1.25K savings** **Delivered in Phase 3, Fiscal Yr. 2012/13. Savings calculated at tech staff rate $130 K (includes benefits)**
Staff time spent manually tracking and updating course and class information in department owned applications, web sites and spreadsheets. **Example from Computer Science:** EECS maintains dept. databases used generate internal class schedules, link to course homepages, keep track of faculty teaching and service loads etc. Every semester we manually create an excel spreadsheet with CCN and other class info for every section of every class; this gets uploaded to our database by IT staff here and then any changes get updated instance by instance by myself or the EE class scheduler.	(Ave. 10 hrs. X 2 staff for 50 biggest depts. + ave. 10 hrs. X 1 staff for 50 smallest depts.) X 2 terms **= 3,000 hrs**	One time costs include all of the costs to build web services for course & class related data. **= $300k**	**750 hrs** Many depts. will no longer choose to spend resources keeping shadow data bases. Those who do, will be able to electronically import complete data from the enterprise web services eliminating manual data entry. This will also make it easier to maintain dept. websites. We anticipate this workload to be cut by ¾. **2,250 hrs & 101.7 K savings** **Delivered in Phase 3, Fiscal Yr. 2012/13. Savings calculated at advisor staff rate $94K (includes benefits)**

Staff time spent seeking useful data to use in predictive planning for class scheduling. This includes looking at historical enrollment trends and working with other departments to sort out dependencies e.g. Math IA and Chem IA can't be offered at the same time. There is no predictive data currently available based on students future plans.	Ave. 80 hrs. per term x 50 large departments and 40 hrs. per term x 50 small departments x 2 terms **= 12,000 hrs**	N/A *(These costs covered in the Enterprise Data Warehouse OE Resource Request)*	**9,600 hrs** This proposal will provide depts. with access to students 2 & 4 year academic plans, as well as individual term schedules, all before registration. The data will be easy to access and clearly presented from the EDW. Over time, pre-registration data collected from students can be compared to the actual registration data for even better predictive planning. Staff access to data from the Academic Planning application will help them to better understand student expectations and preferences. **2,400 hrs & $ 108.5K savings** **Delivered in Phase 2, Fiscal Yr. 2012/13. Savings calculated at advisor staff rate $94K (includes benefits)**
Staff time spent by Academic Departments & Registrar's Office communicating (mostly by email) new and modified course information, rules and requirements to be encoded into DARS.	Ave. .5 hrs. per week X 100 Dept. staff and Ave. 10 hrs. per week X 2 OR DARS staff = **3,640 hrs**	N/A *(These costs covered in the breadth requirements web service above and the course service)*	**1,820 hrs** DARS staff will get all official course and class information from the course and class web services instead of ad-hoc from department staff. They'll be able to get updated requirements as soon as changes are made and they won't have to perform extra catalog checks for accuracy resulting in across-the-board ½ decrease in time spent managing this process. **1,820 hrs & $82K savings** **Delivered in Phase 3, Fiscal Yr. 2012/13. Savings calculated at advisor staff rate $94K (includes benefits)**
Staff time spent managing the current registration process including system crashes: - regular work to support the registration process - diagnosing the cause of crashes - managing fallout from crashes -	**1 OR prof staff:** 520 hrs. per yr. **4 OR student services staff:** 20 hrs. per 12 peak weeks + 4 hrs. per week x 40 weeks = 1,600 hrs per yr. **2 IST tech staff:** 16 hrs. per 8 peak weeks + 4 hrs. per week x 44 weeks = 608 hrs per yr.	One time costs include the cost of building registration web services to replace the TeleBears and Periweb registration	**1,364 hrs** Instability and periodic failures will be eliminated when web services replace the Periweb registration software. Well designed web services will also make routine support of the registration process easier. We estimate effort required to support the registration process

phone, email & in-person - fixing the problem - communicating & logging after recovery	= **2,728 hrs**	system. = **$475k**	will be cut in half for all of the staff roles.. **1,364 hrs & $ 50.8K savings** **Delivered in Phase 4, Fiscal Yr. 2014/15. Rates for savings calculated: prof staff = $94K, service staff = $52K & tech staff = $130K (all include benefits)**
Staff time spent managing the wait-list and the add/drop process.	185 schedulers X average of 8 hours per week x 6 weeks per term x 2 terms = **= 17,760 hrs per year**	N/A	**13,320 hrs** Students make **better informed** academic plans and Depts. use predictive planning data for scheduling classes resulting in **fewer wait-listed** students. The registration web services will improve the wait-list process. The time spent on managing wait-lists will decrease by ¼. **4,440 hrs & $200.6K savings** **Delivered in Phase 4, Fiscal Yr. 2014/15. Savings calculated at advisor staff rate $94K (includes benefits)**
Staff time spent maintaining the Online Schedule of Classes.	1 OR staff member spends 8 hrs. X 4 weeks leading to release and 1hr. per week x 20 weeks for maintenance (per year term) x 2 terms **= 104 hrs per year**	One time costs include the effort to make the pilot class service production ready. = **$50k**	**0 hrs** The Online Schedule of Classes will be retired. **104 hrs & $4.7K savings** **Delivered in Phase 3, Fiscal Yr. 2012/13. Savings calculated at advisor staff rate $94K (includes benefits)**
Staff time spent maintaining the class registration system (TeleBears, Periweb and the mainframe)	4 staff in IST spend 4 hrs. for 50 weeks per year. = **800 hrs**	N/A (These costs covered by building registration web services listed above)	**400 hrs** Technical staff will no longer spend time servicing the unstable portions of the registration system. Instead, staff will only need to manage the new web services and the back-end registration mainframe. **400 hrs & $25K savings** **Delivered in Phase 4, Fiscal Yr. 2014/15. Savings calculated at tech staff rate $130K (includes benefits)**
Staff time spent maintaining the mainframe Course System and the Application Services Oracle	1 IST staff ave. 686 hrs. per year (1/3 of her time). **= 686 hrs**	N/A (These costs covered	**40 hrs** Because of the availability of the Course web services/API's,

tables. .		by building course web services listed above)	dependence on the mainframe Course system will drop to almost nothing. Unfortunately, we can't fully retire Course until we also retire the mainframe Class system. **646 hrs & $40K savings** **Delivered in Phase 3, Fiscal Yr. 2012/13. Savings calculated at tech staff rate $130K (includes benefits)**
Total Impact on Staff	**Total 53,403 hrs** *Not whole jobs.*	**Total ?? hrs**	**Total 35,049hrs** **Total 18,354 hrs & $837K savings** ***est. 35% reduction in workload***

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*).

Deliverables:

1. Phase 1 Deliverables: Make basic Academic Planning tools available to students immediately: (~Month 1-10)
   - A. Conduct a Feasibility Study for Academic Planning & Registration Tools: Integrated Course/Class View, Class Schedule Builder, 4- and 2-year Academic Planner
   - B. Negotiate collaborative engagement plan and contract with the chosen vendor including overall 5-year vision, milestones, costs, timeline, deliverables, periodic reviews and evaluation, and relationship termination terms and conditions. Develop an Electronic Data Exchange Agreement between UCB and vendor (for non-sensitive data)
   - C. Software procurement/development & integration (if necessary)
   - D. Develop official data feeds to Academic Planner inclusive of: Courses, Class Schedule, Grade Distribution
   - E. Support for Schedule Sharing w/Advisors & Peers: Re-engineer paper-based business process for how advisers review schedules & issue registration codes to incorporate Vendor Solution's utility for emailing proposed schedules.

2. Phase 2 Deliverables: Collect & Display More Complete UCB Course Information (~Month 9-19)
   - A. Integrate CalNet Authentication with Academic Planner
   - B. Develop interfaces to provide data feeds to Academic Planner for Degree Requirements
   - C. Set up a data transfer of student self-reported data from Academic Planner to the UCB Enterprise Data Warehouse
   - D. EDW development of reports to support institutional planning of class offerings based on student plans

3. Phase 3 Deliverables: Web Service Development; Capture and Provide New Course Data: (~Months 13-21)
   - A. Capture and store Breadth Requirements and additional Department Course information in Course Management system.
   - B. Capture and store more structured course and class information, and perhaps introduce a structured syllabus, in bSpace or the Course Management system.
   - C. Implement web services to replace data feeds to Academic Planner. Data to include Courses, Class Schedule,

Grade Distribution

D. Implement web services to augment interfaces to Academic Planner. Data to include syllabus data, college breadth requirements, selected student-to-student data from UCB course evaluations, departmental course information, selected program requirements and learning objectives (from course management system)

4. Phase 4 Deliverables: Add Interactive Academic Planning & Registration Tools (~Months 16-36)
   A. If using Vendor, negotiate security & privacy contract for non-public data
   B. Develop Registration web service(s) (to replace Periweb middleware)
   C. Build UI functionality for students to register from schedule builder
   D. EDW development to accept student registration data from mainframe (if needed)
   E. Develop Web Service to interface with student degree audit engine

Enterprise Data Warehouse(EDW) / Business Intelligence (BI) Solution

A separate OE proposal is being submitted that includes the work effort to load the student registration and class evaluation data into the EDW and provide supporting BI reports and dashboards. This student registration EDW/BI project will provide incremental deliverables in support of the development efforts outlined above.

Constraints:

1. Phase 1
   A. Resources for conducting feasibility study for Academic Planning & Registration Tools
   B. Contract negotiation resources, policy resources
   C. Ability to quickly gather the project team resources (functional and technical)
   D. Develop agreement and sign contract with vendor for public student data
   E. Rapid business process change for advisor issued registration codes

2. Phase 2
   A. If using Vendor, support of CAS authentication and data feeds from their systems
   B. Source of data for class syllabus and selected student-to-student course evaluation data
   C. Project team resources (functional and technical)
   D. EDW project funded in support of academic planning.

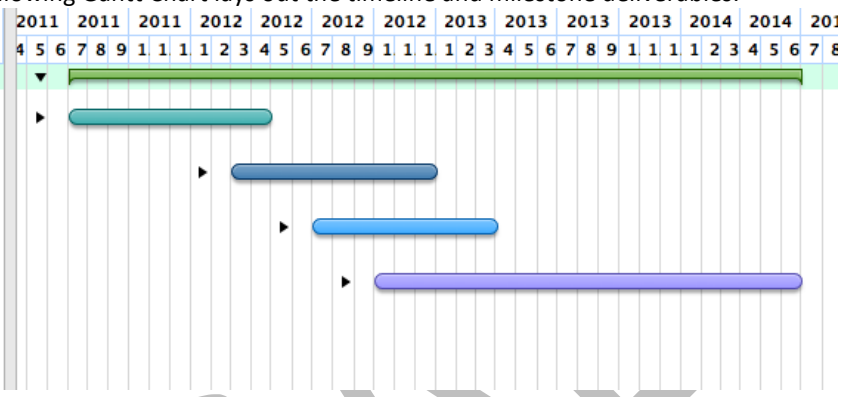
3. Phase 3
   A. Web services technical stack of software and infrastructure production-ready
   B. Source of data for class syllabus information and selected student-to-student course evaluation data, departmental course information, program requirements and learning objectives
   C. Project team resources (functional and technical)
   D. EDW project funded in support of course enrollment

4. Phase 4
   B. Periweb technology for supporting student registration must be replaced ASAP
   C. Contract negotiation resources, policy resources
   D. Web services technical stack of software and infrastructure production-ready (including message bus and web services registry)
   E. Interfaces to keep UCB systems in sync with registration data from Academic Planner
   F. EDW project funded in support of course enrollment

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.)

Assuming implementation were to start July 2011, the following Gantt Chart lays out the timeline and milestone deliverables:

Task	Start	End
1) Academic Planning & Registration	7/1/11	6/30/14
1.1) PHASE 1 Deliver Student Class Schedule Builder & Academic Planner	7/1/11	4/30/12
1.2) PHASE 2 Collect & Display Richer Class Course Information for Students & Staff	3/1/12	1/1/13
1.3) PHASE 3 Web Services Development / Capture New Course Data	7/2/12	4/1/13
1.4) PHASE 4 Add Interactive Academic Planning & Registration Tools	10/1/12	6/30/14



Please refer to the Appendix for an expanded Gantt chart with a more detailed task breakdown.

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

This project has requirements for both collecting and provisioning data.

1. **Data Collection**: Information that is currently not captured and stored in a structured format that is required by this project.
   - College breadth requirements
   - Class syllabus information
   - Self-reported student academic planning data
   - Departmental course information

2. **Interface Development for Existing Systems**: Information that is captured and stored in a structured format that is required by this project.
   - Courses, class schedule, grade distribution
   - Degree and breadth requirements
   - Learning objectives
   - Selected student-to-student course evaluation data
   - Syllabus information taken from bSpace

3. **Data Provisioning:**
   - A separate OE proposal is being submitted that includes the work effort to load the student registration and class evaluation data into the EDW and provide supporting BI reports and dashboards.

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

This project relies on University investment and ongoing production support of several key technologies and technical protocols:

1. **Integration with CalNet for Web Single Sign-On**
2. **System must pass Security Review**
3. **Enterprise Data Warehouse** for data storage
   - EDW project funded in support of course enrollment and supporting data subject, reports and dashboards.
4. **Enterprise Web Services** for data access
   - Web services technical stack of software and infrastructure production-ready (including message bus and web services registry)
5. **Other Technology Considerations**
   - Periweb technology for supporting student registration must be replaced ASAP

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

	RISK	MITIGATION PLAN
1.	Preferred vendor(s) decline to engage with UCB	We will make our selection of vendor solution (borrow) or software (buy) based on 3 criteria. 1. The best value in delivering a great user experience for our students as quickly as possible. 2. Low maintenance for UCB. The solution delivers to our students without needing significant support from UCB staff. This will free us to invest in our campus service infrastructure and registration back-end. 3. Interfaces, and shared architecture, between UCB and the solution are secure, yet loosely coupled, thus allowing us to exit from the vendor relationship or to switch the UI application quickly, should it cease to be in our interest, with the least amount of disruption to our students and business operations. Should our first-choice vendor decline the relationship, we will simply need to look elsewhere for the next best fit. As certain criteria are non-negotiable, such as security, the trade-off will likely be between delivering value to our students quickly vs. the cost of co-development with a lesser vendor, software product or outsourced development.
2.	Partnership with any vendors dissolves within 5 years	All necessary due diligence will be done in order to ensure that the following is negotiated and appropriately documented in the contract: termination and disentanglement; benchmarking; performance-based metrics; penalties and incentives; allocation of resources; and innovation.
3.	Web Services development cannot keep pace with our timeline	If the web services tech stack is not production-ready before development of web services needs to begin, the project team can begin development on the proof-of-concept technical stack or develop alternative interface solutions.
4.	FERPA is inadvertently violated	Limit access to non-public student data to only appropriate staff. Provide FERPA training for all staff/vendors who have access to student data. Ensure that vendor meets campus security guidelines and regulations.
6.	Enterprise Data Warehouse development cannot keep pace wtih our timeline	If we could not rely on the EDW keeping pace with our timeframe, then the course data available for academic planning would not be as rich. We wouldn't have easy access to most historical data. In fact, until the mainframe is replaced, the information that we depend on in this project could, with much greater difficulty, be obtained from the same source used by the EDW. We don't propose heavy reliance on the EDW until it's ready to drive institutional curricular planning which gives us some flexibility in the timeline. Our solution would be to delay the large benefits in operational efficiency enabled by predictive planning data, shifting resources to another aspect of the project until the EDW matured enough to deliver data that supports strategic curriculum planning.
7.	Lack of UCB IT skills to develop web services	The strategy for developing an enterprise web service infrastructure does not rely exclusively on internal technical talent but rather it assumes a substantial role for outside expertise. With regard to defining the business use for each web service and the means of interacting with the service, the pilot IST web services project which is already underway will serve as a very valuable first iteration for essentially the same information that we hope to capture and leverage in this proposed solution.

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

This project is a departure from the traditional higher ed institutional administration technology project in that:

- **it is agile** : delivers new features or improvements for students and staff every three months

- **it is evolving** : starts with simple functionality and gradually develops into more complex information and behavior
- **it operates on short cycles** : frequent evaluations and check-ins with steering committee and advisory groups
- **it is test driven** : user participation and feedback will drive design and define and prioritize the detailed functional scope
- **it leverages existing platforms** : more energy can be spent on effectively leveraging and improving a platform or product rather than establishing and refactoring a new one.

These are the key ingredients for a project to be able to support continuous improvement and course correction.

V. CHANGE MANAGEMENT

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

Successful implementation of the Academic Planning and Registration proposal will change how we experience and manage a number of registration-related tasks on campus. The objectives of our proposal are to:

- Improve the **user experience for students** by providing them with a well designed, easy to use web site that gives them all the information they need to make the best possible academic plans and to register quickly and efficiently.
- E**liminate the looming risk** of our outdated and unsupported registration system failing
- I**ncrease operational efficiency** and **add value** for the university by streamlining data collection and distribution on the one hand and also by creating the foundation for a much more strategic and profitable use of our institutional data

None of these objectives is a particularly difficult sell among students or staff. And since our project is **agile, iterative and driven by user-centered design,** the new tools and interfaces should be enticing to uses to adopt. If they aren't, the project will have failed. Our more likely challenges will center around how to best inform the beneficiaries of the this plan about the improved systems and services at their disposal. Of most concern, we anticipate an efficiency learning curve - a period of time when Deans, Directors, Advisors and Staff must figure out how to incorporate the increased access to data into their planning and operations in order for the University to realize maximum value from these new tools.

The change management plan identifies those who will be impacted by the introduction of the new tools, the behavior changes required and how these will be reinforced, anticipated resistance and plans for mitigation, and the implementation plan. See appendix for details.

I. Impacted Groups:

- 36,000 Students: 25,000 Undergraduate, 11,000 Graduate and Professional School Students
- 640 Advisors: 325 Academic and 315 Faculty
- 130 Academic Departments
- 85 Class Schedulers
- IT Staff: Data analysts, technical analysts, application developers
- Office of Planning and Analysis
- Office of the Registrar

II. How Business will Change:

- Phases 1, 2, & 3 students will now have the **opportunity** to use a Berkeley sponsored Academic Planner.
- By Phase 4 they will be required to use the Berkeley sponsored Academic Planner, at least for registering for classes.
- Advisors will have the opportunity to electronically communicate with students (those they have no other need to see) to approve their schedules and release the advisor code required for registration.
- L&S Staff will manage breadth requirements in the new Course Management system.
- The Academic Planner and the Course Management systems will replace the Online Schedule of Classes as a place to view class data
- Dept. Class Schedulers and Curriculum Planners will have access to predictive enrollment data when making decisions about what courses to offer each term.
- The aspect of the Registration systems that periodically fails will be replaced.

- Registrar and IST staff will have better tools support and maintain the registration systems infrastructure.

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

Incentives for students to use the Berkeley Academic Planner:

- Confidence that it's secure
- Trust that the data is accurate
- More comprehensive and useful data than competitors
- User interface easy and pleasing to use
- Application easy to find and clustered with other important student applications in the Student Portal.

Incentives for staff:

- Easier to view data
- Easier to harness data for department and university business
- Time saved moving manual to electric and automated
- Easier and faster to innovate and improve services

Disincentives:

- Departments that don't avail themselves of predictive planning data will be less responsive and competitive than their peers who do
- Deans and Directors who don't support strategic data analysis can be held accountable inefficient performance
- Application developers who continue to rely on data feeds and materialized views will be unsupported by IST

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?

Change Leaders:

Campus Partners/Stakeholder Representation from the following:

- Harry LeGrande, Vice Chancellor, Student Affairs
- Catherine Koshland, Vice Provost, Teaching, Learning, Academic Planning and Facilities
- Cal Online Student Experience (COSE) Task Force
- AVC Erin Gore & the Institutional Data Management & Governance (IDMG) Council
- CIO Shel Waggener & Information Services & Technology (IST): Enterprise Services & EDW
- Mara Hancock, Director, Educational Technology Services (ETS): Student Portal & Academic Commons
- Angela Blackstone, Chief Technology Officer, Student Affiars
- Advising Council
- Council of Undergraduate Deans
- Deans & Department Chairs: Schools, Colleges & Academic Departments

Implementation Team Member Recommendations:

Sponsor: Anne De Luca, University Registrar
Student Subject Matter Experts/Testers: Undergraduate, Graduate, Professional School
Staff Subject Matter Experts/Testers:

- Academic Advisors
- Dept. Class Schedulers

- Dept. Chairs and Curriculum Planners
- Registrar Staff
    - Class Scheduling Services: Susan Tonus
    - Registration Services: Rose Chan-Gee & Doug Au
    - Degree Audit Services: James Collins & Raul Infante
- Office of Planning & Analysis Staff

Project Managers: Johanna Metzgar & Sara Quigley
Business Analyst: Sara Quigley
Business Owner/Functional Lead: Johanna Metzgar
Administrative Support: OR Staff
IT Roles:

- Student Designers & Developers
- IST DBA
- IST Application Support
- Web Services Architect: George Atala
    - Web Services Programmer
- EDW Architect: Greg Hamilton
    - EDW Data Analyst
    - EDW Programmer Analyst
- GWT UI Developer: Ivan Bahdanau
- Data Analyst Programmer: Tom O'Brien
- Integration Architect:
- DARS Programmer: Raul Infante
- IT Acquisition Support: David Willson
- CalNet Manager: Dedra Chamberlin
    - CalNet Integration

Consultants: Simple But Needed
Vendors: *possible candidates:* CourseRank, Ninjacourses, Semesterly, UW Scheduler, College Scheduler

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 is designed in phases in order to accommodate several funding cycles. Each stage of the plan provides measurable benefits to campus constituents all the while investing in the campus information infrastructure to support processes and tools that will be needed in order to make informed, responsive decisions.

Please see the four project phases outlined in the project Gantt chart, along with the corresponding budget detail (see cost tabs phases 1-4)

Later phases are dependent upon earlier phases, but each has successive stand-alone benefits. Our current timeline allows for parallel development (i.e. overlapping phases) in cases where resource allocation is not redundant. For instance, there is negligible resource overlap between the effort to collect course breadth requirement data and work to import student planning data into the Enterprise Data Warehouse for analysis purposes. Developing in overlapping phases optimizes the project's overhead and by allowing for the shortest overall timeline. However, if the campus were unable to fund the overlapping phases, the project could move forward in a linear sequence although it would increase the overall project costs and increase the risk of current systems failing.

We strongly advise that this project be supported as a whole. It is fair to proceed with funding cycles, contingent on demonstrated success in meeting project goals and milestones. But each benefit of this proposal is critical to the campus community and therefore, the plan should be supported in its entirety.

This proposal can be boiled down to four value propositions:

1. **We cannot leave another generation of students behind** by ignoring their needs and disrespecting their time.

2. **We cannot ignore our own operational and security risks** stemming from an unstable and unsupported registration system.

3. **We need to be more effective, efficient and competitive** as we design and offer curriculum. We cannot do this unless we can access and understand what the data tells us about student needs and expectations.

4. The next generation of system replacements and process re-engineering will be **much less costly and disruptive** if we make the investment in a common-good data infrastructure and enterprise service architecture today.

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

There are 3 areas of ongoing support required for this proposed solution:

1. **Ongoing Application Support** for Registration-Related Applications: UI development, business analysis, production control, data analysis and programming.
2. **Enterprise Data Warehouse Support**: platform, data, reports and dashboards.
3. **Enterprise Web Services Support**: technical stack of software, infrastructure including message bus and web services registry, production ready services

The first is addressed in the budget for this project (see ongoing cost breakdown in budget) and second two are addressed in other OE Resource Requests, the Enterprise Data Warehouse proposal being submitted by AVC Erin Gore and the Enterprise Web Services proposal being submitted by CIO Shel Waggener.

The benefits of this proposal will extend well beyond current-state benefits, and after initial upfront investment, the cost of ongoing operations will be about $138K (inc. salaries). However, at least $80K of this is accounted for by current state funding. In other words, $80K of technical dollars spent today to keep up our current Registration application can be redirected to support the improved Registration application. Thereby leaving about $58K of new money needed to support a vastly improved student experience. These new dollars can be supplied by the Office of the Registrar or Student Affairs IT.

The enterprise campus projects for storing data (EDW) and sharing data (Enterprise Web Services) will require increased funding and new resources as we move forward. Both of these technical projects are critical to the goal of improving Academic Planning and Registration services at Berkeley.

This proposal covers the one-time project funding to *develop* a number of web services. It is our understanding that the web services infrastructure and the *ongoing operations and maintenance* of these web services will be funded independently as part of the IST Enterprise Web Services Resource Request. The EDW Resource Request sponsors have indicated that the EDW unit will absorb all costs related to EDW-support of this Academic Planning and Registration proposal.

The information that is collected and the interfaces that are created for the purposes of this project will be useful to many academic and administrative departments across campus and therefore provide a “common good” benefit to the University.

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 ant line descriptions. Include both completed sheets with the Resource Request.

VII. 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
EXAMPLES:						
FINANCIAL PERFORMANCE						
1 Reduction in average price of office supplies	*Avg price*	*Per item*	*Look at vendor catalogs*	*Quarterly, first day of each quarter*	*Procurement Director*	*Overall reduction of 15% in average price of office supplies*
OPERATIONAL PERFORMANCE						
1 Reduction in average processing time per transaction	*Avg person-hours required*	*Per transaction*	*Survey of transaction processors*	*Semi-annually*	*Director of Billing*	*Reduction of 20% in average transaction processing time*
FINANCIAL PERFORMANCE						
1						
2						
OPERATIONAL PERFORMANCE						
1 Reduction in the # of times a student changes their class schedule	# of schedule changes	Per student per term	Application and database logs	Semester	Student Affairs	Reduction in time to degree
2 Reduction in # of waitlisted students						
3. Reduction in staff person hours	Person Hours	By school or department or campus	Unit and central campus staff time	Annually	Student Affairs	Achieve 35% reduction in staff hours related to maintaining academic planning & registration support tools
4. Availability of registration system	downtime as a percentage of hours	per user community	system logs	Semester	Student Affairs	Improved student, staff and faculty experience
5. Response time of registration system	avg response time	per transaction	system logs	Semester	Student Affairs	Improved student, staff and faculty experience
6. Operational value of web services	# of systems/devices that access the web services	per web service interface	system logs	Semester	Student Affairs	Lower barrier to data access for authorized users
PRODUCT / SERVICE QUALITY						
1						
2						
EMPLOYEE SATISFACTION						

1 Staff	Functionality and usability	By campus	Usage & Feedback Forums	Semester	Student Affairs	Higher levels of job satisfaction
2 Faculty	Functionality and usability	By campus	Usage & Feedback Forums	Semester	Student Affairs	Improved curriculum planning; more effective management of faculty workload
CUSTOMER SATISFACTION						
1 Students	Functionality and usability	By campus	System logs, Feedback Forums, Focus Groups	Semester	Student Affairs	Improving the student experience
2 Staff	Functionality and usability	By campus	System logs, Feedback Forums, Focus Groups	Semester	Student Affairs	Ability to better serve students
PUBLIC RESPONSIBILITY						
1						
2						
SUPPLIER PERFORMANCE						
1						
2						