



DESIGN PHASE BUSINESS CASE

University of California, Berkeley

OVERVIEW

DESCRIPTION	Comprehensive document summarizing the Design phase findings and Implementation phase recommendations <i>In some instances, initiatives may be comprised of distinct projects which may be proposed before the Design phase is complete. In those cases, a preliminary business case will be required to set the context for the proposal.</i>
OWNER AND AUDIENCE	Owned by Initiative and Functional Sponsor and presented to the Executive Committee for approval before the Initiative can move into Implementation
TIMING	To be completed by the end of the Design stage

NOTES

- Template includes a PowerPoint file (OE Design Phase Business Case.ppt) and an Excel file (OE Design Phase Business Case Financial Analysis.xls)
- A signed hard copy of the Business Case should be submitted to the OE Program Office with electronic copies of both files
- Additional detail may be included by adding additional slides in each section or in back-up

SPONSORSHIP

Initiative

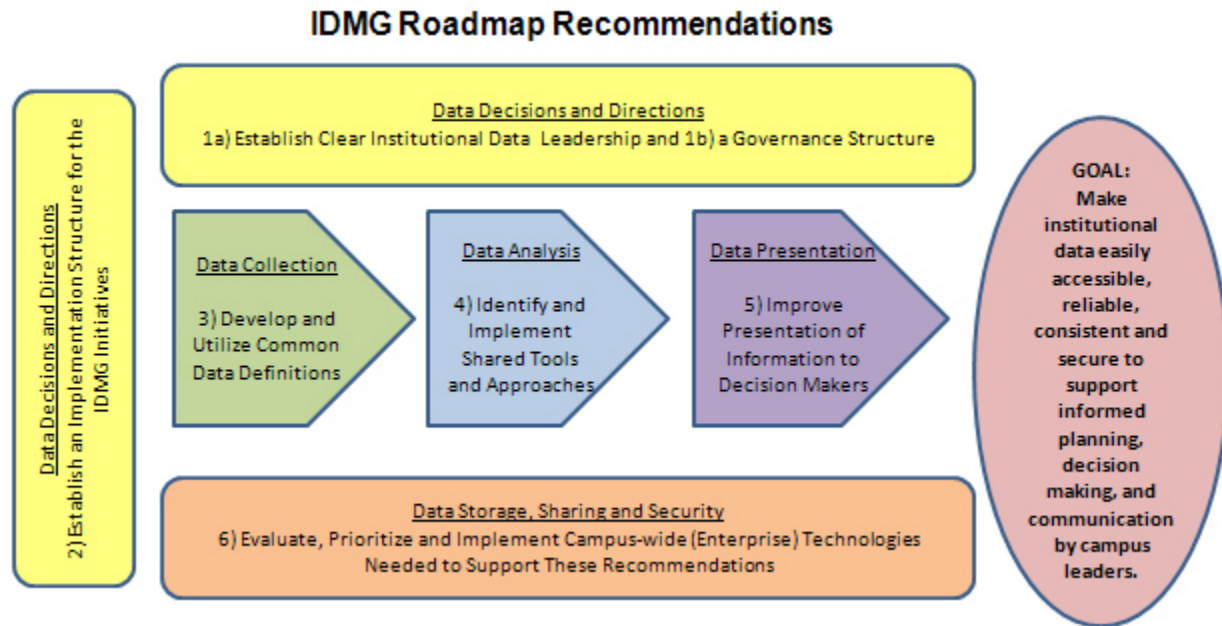
INITIATIVE	IDMG / IST Enterprise Data Warehouse		
INITIATIVE MANAGER	Pamela Brown Karen Kato		
PHONE	2-7059 3-3371	E-MAIL	phb@berkeley.edu kkato@berkeley.edu

Sign Off

SPONSOR NAME	Budget & Finance, IDC Chair - Erin Gore		
SPONSOR SIGNATURE		DATE	
SPONSOR NAME			
SPONSOR SIGNATURE		DATE	
OE PROGRAM OFFICE SIGNATURE		DATE	
Notes			

SUMMARY OF RECOMMENDATIONS

Operational Excellence (OE) and its initiatives are reliant on accessing and utilizing accurate and timely data that will allow campus leaders to track and measure success. It is essential that the campus does not create separate systems to support OE data needs, but instead invests in central systems that will serve both OE and the campus community. For too long, the campus has cited concerns over the proliferation of shadow systems to support individual unit needs. Therefore, the campus' Institutional Data Management and Governance (IDMG) initiative was initiated with the goal of making "institutional data easily accessible, reliable, consistent and secure to support informed planning, decision making, and communication by campus leaders."



The final step in the IDMG roadmap is to "prioritize and implement campus-wide (enterprise) technologies needed to support these recommendations." Investing in the campus Enterprise Data Warehouse (EDW) can both support OE data needs, along with the campus- decision making efforts and as EDW content expands and functionality improves, the campus will see the reduction of shadow systems. Furthermore, it will result in better use of staff time by improving access to information, shifting the workload from data collection to analysis and the discussion from methodology to content, and improving data security concerns by centralizing sensitive information in an EDW.

Under direction from the Institutional Data Council (IDC) and the OE Faculty Head, the EDW and Business Intelligence (BI) function is recommending the following prioritized projects:

1. Student Enrollment – Add new course, class schedule, registration, course evaluation, program management, CSIR, TeleBears data in the EDW with reports and dashboards in OBIEE Cal Answers. Evaluate the offering of statistical packages for analysis.
2. Student Financial Statement – Add new financial aid, CARS, GLOW and Work Study data in the EDW with supporting reports and dashboards in OBIEE Cal Answers.
3. Procurement – Provide operational reports and management dashboards for purchase order, voucher, invoice and payment detail data in OBIEE Cal Answers.
4. Governance – Add a new Institutional Data Manager position to develop and administer governance processes and project management support of the EDW and other IDC initiatives.
5. HR and Finance - Provide performance metrics, reports and dashboards in support of the High Performance Culture and Financial OE initiatives, fully integrate HR and Finance data in the EDW, convert existing BAIRS reporting to OBIEE Cal Answers.

We seek OE support in not only supporting these specific projects by identifying a way to invest common good funding in this central campus good. Continued investment in the EDW/BI function lower the bar so that future data projects will cost less to implement.

FINANCIAL ANALYSIS

- Year by year breakdown of savings and costs, Key assumptions

Attach Excel file of financial analysis.

PROBLEM STATEMENT/NEEDS ASSESSMENT

- Objectives, Situation, Opportunity

IDMG, EDW and BI Objectives

- Fully integrate campus data to securely facilitate rich analysis across subject areas. Improve data access request processes and systems.
- Provide easy-to-use and reliable BI tools that allow campus users to quickly access and visually present the data they need to make decisions. Certify reports and metrics for reliable and consistent communication of data. Improve user efficiencies by providing pre-built metrics and reports, allowing for quick development of ad hoc reports and reduce the time spent validating data sources.
- Improve efficiency and reduce expenses by reducing and eventually eliminating the need to maintain local data stores (shadow systems).

EDW & BI Background

A five year plan was developed for the Enterprise Data Warehouse (EDW) and Business Intelligence (BI) function last year. The plan focused on incremental growth in three areas:

- 1) Core elements of the EDW used to integrate different data subjects
- 2) Additional data subjects
- 3) Improved reporting and dashboard (BI) solutions for data presentation and visualization

Significant progress has been made in all 3 areas over the last year. We look to build upon that foundation to become a powerful engine for informed decision-making. The work recommended in this proposal will deliver significant and visible value to the campus. However, the EDW will not be complete at the end of five years. The EDW and BI solutions will need to continue to evolve and grow to reflect the needs of new data sources and campus analysis needs.

The EDW and BI function will seek an investment in funding for new projects over the next 4 years. Unlike other applications where there is a large initial investment and then a longer period of maintenance, the EDW/BI function has proven to be more successful through incremental growth. A continued investment allows for the addition and refinement of new data and BI solutions and helps lower the bar to integrate data sources into the EDW when units don't have the funding to support that effort. The work effort for initial projects is larger than subsequent years, as later projects will build on work performed earlier. In the first and second year we will be able to complete only one to two projects, but by the fourth and fifth years we expect to be able to complete three to four per year at an equivalent cost.

Not investing in the EDW will cost the university considerably more in inefficient operations, poor decisions, inaccurate publication of data, lost opportunities, continued maintenance of redundant shadow systems, and increased risk of data loss and theft.

The efficiency benefits gained by campus analysts will likely be funneled into more productive work, but not cost savings. Over time, as the EDW continues to expand subject areas and improve BI solutions, local shadow systems can be eliminated and provide hard expense savings.

- *When analyzing workflow, she says, supervisors and managers should find out if projects or programs are being duplicated elsewhere on campus; determine how many steps it takes to complete specific assignments and see if the process can be streamlined; and ensure that automated systems are being used to their full potential. "When new electronic procedures emerge, people are sometimes reluctant to embrace them because they're more comfortable with the old way," says Ventre-Hutton. "In these situations, shadow systems are often created and staff end up managing two systems instead of one." **Working with Budget Cuts – Tips for Managers & Supervisors (Feb 19, 2003)***
- *Another concern is that units will be unwilling to give up their shadow systems. The current overhead associated with using multiple shadow systems is obviously very high. Experience has shown that departments are willing to move to an EDW environment if they stand to realize benefits in costs, data access, and/or data security. **EDW Initiative (December 2005 Report)***
- *As described in the recently released Undergraduate Outcomes Task Force Report: "The campus faces a major disconnect between the*

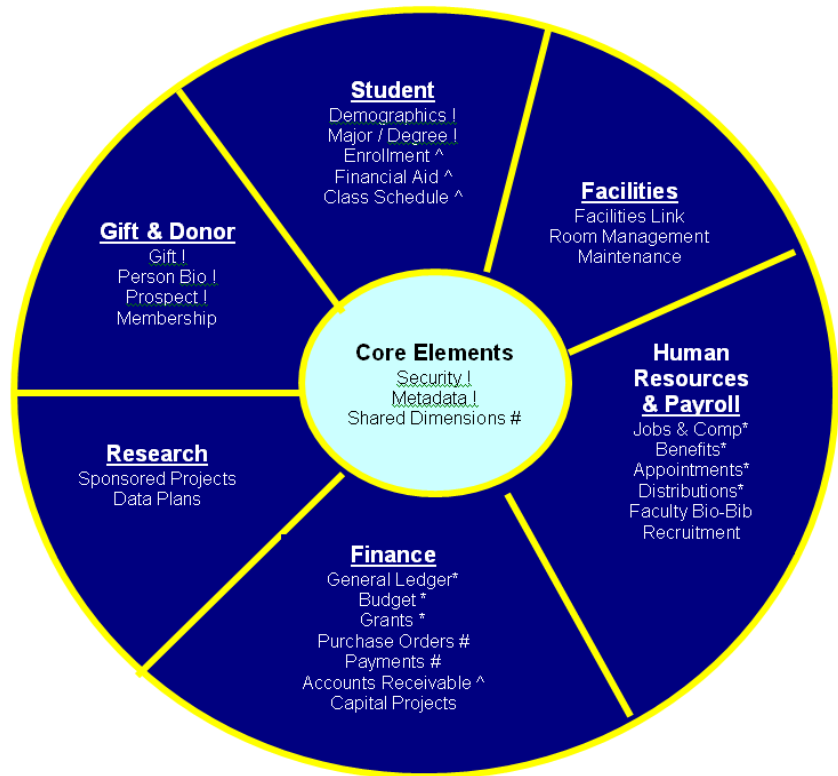
types of sophisticated questions that we are asking about our institutional performance and the internal organization of the data needed to respond to such questions.” The report also captures many of the institutional data challenges that have been noted over the past several years at UC Berkeley, including institutional research professional staff must spend valuable time “data-mongering,” (i.e., producing time-consuming extracts in order to exchange data across silos) or maintaining duplicative shadow systems, rather than conducting in-depth data analysis that will inform strategic planning efforts. **IDMG Proposal (Sept 2007)**

EDW/BI Accomplishments – A Foundation for Growth

Our recommended projects will utilize the foundational EDW/BI work below that has been accomplished in the last year:

Core Elements Implemented

- A shared campus person model that facilitates the integration of students, employees, donors/prospects and financial approvers/requesters.
- A shared campus calendar that facilitates analysis on academic, fiscal and Julian calendars.
- A complex security scheme that will support data viewing restrictions by row or column as defined by the campus data proprietors. This allows for the EDW to be reporting tool independent.
- A data access request application that automates workflow for requesting, approving and provisioning user accounts.
- Metadata that describes new data subject areas, tables, data columns and calculations.



I=Complete, #=In Progress, *=Needs Enterprise with Core Elements, ^=Recommended

Data Implemented

- Gift, donor and prospect data has been integrated.
- IST billing data has been integrated.
- Student ethnicity, applicant, registration and degrees awarded data has been integrated.
- Procurement detail (purchase orders, vouchers and invoices) has begun to be integrated, but is incomplete.

Business Intelligence Tools Implemented

- The OBIEE based Cal Answers application has been installed and configured for UCB.
- Calnet authentication has been setup and ties into the database security.
- A process and environment that supports development for multiple projects has been defined.
- Preliminary training materials have been developed, but will need additional work.

EDW Opportunities:

Incrementally build upon the foundation of the existing data in the EDW to integrate data from new source systems, improve data security, reliability and accuracy. Reduce data duplication and hosting costs of maintaining data in multiple systems.

Provide easy-to-use BI tools to produce reports and dashboards and facilitate quick development of ad-hoc reports to meet the growing campus analysis and visualization needs.

Reduce costs by eliminating or reducing support for 2 enterprise BI tools.

RECOMMENDATIONS (Extended; summary above.)

- Deliverables, Rationale, Costs/Benefits/Risks, Key assumptions

Deliverables / Rationale

- Data Added and Integrated in EDW = Course, Course Evaluation, Class Schedule, Class Registration, Instructor Record, Financial Aid, CARS, GLOW, Work Study, Purchase Orders, Vouchers, Invoices, Payments. This data has been identified as a critical campus need by the OE Student Services initiative, the UCSF/UCB Procurement Project Team and the IDC.
- Reports and Dashboards = Supporting Student Enrollment, Course Catalog, Class Schedules, Student Financial Statement, Financial Aid, Procure to Pay, HR Census. These supporting reports and dashboards will present the new data subjects above to the campus in an easy-to-use format that will enable adoption. In addition, campus analysts will be able to quickly develop ad-hoc reports to meet the ever changing campus needs.
- Governance = Develop, publish, implement and administer the EDW/BI governance process and provide project management support of the EDW/BI projects. The governance process will provide for transparency, prioritization and oversight of resources for the EDW/BI solutions that best meet the needs of campus.

Costs

- Total Costs of Recommendations: \$x

Benefits

- Benefits include campus user efficiency through a better use of staff time focus 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:
 - Automated workflow to seek access to data
 - Consistent and reliable certified data means less time validating data sources
 - Faster development of ad hoc reports through easy-to use tools and pre-built reports and metrics
 - Improved accuracy of published data
 - Improved analysis by presenting data exceptions for investigation
- Shadow systems for data collection can be reduced 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.

Risks

- Ongoing Funding – While one time funding of the projects may be covered by OE, we will seek common good funding for the ongoing additional costs.
- Resource Availability –EDW and source system technical expertise and functional business analysts will be required to provide timely solutions and successful projects. Given the number of OE initiatives, this will need to be coordinated on campus so as not to overtax limited resources.

Key Assumptions

- The scope, resource needs and timing for the projects have been developed with varying degrees of project knowledge. Once the initial OE prioritization process is complete, the EDW/BI team in coordination with functional leads will further refine the scope, project assumptions, risks, resource needs and delivery timing.
- During the project development cycle, the surge in staffing levels will be filled with temporary or contract employees.

ALTERNATIVES CONSIDERED (including status quo)

- Costs/Benefits/Risks, Key assumptions

The alternatives considered for each project will be described in the request for resources. For the EDW recommendations overall, the following alternatives were considered.

Status Quo – We could not add new data subjects and maintain the existing data. The cost of falling further behind on integrating campus data in the EDW would extend the need for shadow systems, continue to expose data security risks and continue to provide limited support to improve analysis capabilities for campus users. The most significant cost for the status quo is repeatedly demonstrated in low quality, highly difficult to obtain and manipulated data maintained locally. As the campus continues to evolved

to one that has consistent reliable data to make decisions, the status quo continually undermines that goal. Additionally, the cost to moving the data to the warehouse and extract falls entirely to small subsections of the campus that do not represent the full value of campus use. In addition, now that 2 BI tools are in production, our software and infrastructure costs would be doubled costing a minimum of \$250K per year.

Vendor Purchased Solutions – In an effort to save functional and technical resources and expedite the requirements process, we have twice tested vendor supplied EDW/BI solutions. On the technical side, the solutions have delivered solutions that are more complex than UCB needs (international support, modules not implemented at UCB, etc) and have proven to require more resources to maintain than custom developed EDW/BI solutions. The EDW/BI function is focused on the integration of data from a multitude of source systems. It would make sense to purchase vendor solutions if many modules were implemented from a single vendor. We don't see that happening in the student or procurement data arena in the near term. The campus demand for the data is too high to wait for vendor solutions. To expedite the functional requirements gathering, we can augment our processes to include solutions implemented at other UC campuses and higher education institutions. This has recently shown promising efficiencies. We would not recommend vendor purchased solutions for the EDW/BI projects recommended in this proposal.

External Experts - On the other hand, the use of expert contractors has proven to expedite projects and improve the quality of deliverables. Even though the costs are higher, they produced quality results in a faster time frame than lower-priced contractors and internal staff could provide. We would recommend the use of market experts to expedite project deliverables.

IMPLEMENTATION PLAN

- Implementation activities, Functional ownership, Timeline

When we receive OE approvals for specific projects to proceed, we will work with the functional owners to further refine the scope, project teams and timelines for the project. Each approved project will have a project manager assigned to manage escalations to the stakeholders and IDC Sponsors. If an Institutional Data Manager position is funded (see Governance proposal), that position would be responsible for coordinating efforts among these projects and supporting the overall IDMG initiative.