



UCSB Audit and Advisory Services
Internal Audit Report

**Enterprise and Campus-wide IT Project Costs
Fiscal Year 2017-18 Review**

July 26, 2018

Performed by:

Antonio Mañas-Melendez, Acting Associate Director
Laurie Liao, Staff Auditor

Approved by:

Kimberly Ray, Interim Audit Director

Report No. 08-18-0019

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AUDIT AND ADVISORY SERVICES
SANTA BARBARA, CALIFORNIA 93106-5140
Tel: (805) 893-2829
Fax: (805) 893-5423

July 26, 2018

To: Joe Sabado, Executive Director & Associate CIO of Student Affairs
Tedi Tehrani, Management Services Officer

Student Information Systems & Technology

Re: **Enterprise and Campus-wide IT Project Costs: Fiscal Year 2017-18 Review
Audit Report No. 08-18-0019**

As part of the 2017-18 annual audit services plan, Audit and Advisory Services has completed an audit of information technology (IT) project costs. Enclosed is the report detailing the results of our review.

The purpose of this review was to ensure that campus practices for estimating, tracking, charging, and reporting IT project costs are appropriate and consistent with best practices and University of California (UC) and University of California, Santa Barbara (UCSB) policies, procedures, and guidance. The scope of this audit was limited to the Student Financial System project and the migration of the Connect project managed by Student Information Systems & Technology (SIS&T) for Student Affairs during fiscal year 2017-18. This audit was the third in a series of planned annual audits of costs charged to major campus IT projects.

We found that processes in place to accurately charge, track, and report project costs are adequate to help monitor and control costs and ensure proper project management. We did find modest opportunities to enhance current budget reporting to be more comprehensive.

Detailed observations and management corrective actions are included in the following sections of the report. The management corrective actions provided indicate that each audit observation was given thoughtful consideration, and positive measures have been taken or planned in order to implement the management corrective actions.

We sincerely appreciate the cooperation and assistance provided by Student Information Systems & Technology and Office of the Chief Information Officer personnel during the review. If you have any questions, please feel free to contact me.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Kimberly Ray".

Kimberly Ray
Interim Audit Director
Audit and Advisory Services

Enclosure

cc: Chancellor Henry Yang
Vice Chancellor for Student Affairs Margaret Klawunn
Interim Vice Chancellor Administrative Services Joel Michaelsen
Matt Hall, Associate Vice Chancellor for Information Technology and Chief Information Officer
Alex Ramos, Director, Resource Planning
UCSB Audit Committee
Senior Vice President and Chief Compliance and Audit Officer Alexander Bustamante

PURPOSE

The primary purpose of this audit was to determine whether University of California, Santa Barbara (UCSB) practices for estimating, tracking, and reporting information technology (IT) project costs are appropriate and consistent with best practices and University of California (UC) and UCSB policies, procedures, and guidance.

This audit is part of the fiscal year 2017-18 audit services plan of UCSB Audit and Advisory Services. The audit is the third in a series of planned annual audits of costs charged to major campus IT projects.

SCOPE, OBJECTIVES AND METHODOLOGY

The scope of this audit included the Student Financial System (SFS) and the Connect project managed by Student Information Systems & Technology (SIS&T) for Student Affairs. We selected samples of transactions from the period July 1, 2017, through May 31, 2018, for detailed review and testing.

The objectives of our review were to determine whether:

- Campus practices for estimating costs charged to the projects comply with applicable provisions of UC Policy BFB IS-10, *Systems Development Standards* (Policy IS-10), and best practices.
- Processes in place to accurately charge, track, and report project costs are sufficient to help monitor and control costs and ensure proper project management.
- Cost figures reported to management are accurate.
- Costs charged to the project are relevant to the project.
- Underlying contracts or purchase orders were in place, current, and otherwise appropriate.
- Rates, prices, and quantities charged are correct or reasonable.
- Goods and services were approved by authorized personnel and were received appropriately.

To accomplish our objectives, we:

- Reviewed previous, related UCSB audit and advisory work (see Table 1).
- Reviewed UC and UCSB policies, best practices, and other guidance concerning IT project costs, including:
 - UC Policy BFB IS-10, *System Development Standards* (Policy IS-10).
 - *GAO Cost Estimating and Assessment Guide – GAO-09-3SP*, published by the Government Accountability Office (GAO).

- Interviewed the Chief Information Security Officer and other managers of major IT projects to gain an understanding of main campus IT projects in progress.
- Updated a risk analysis of IT projects from our first annual audit of IT project costs to reflect current timeline and cost information and the results of our interviews and observations.
- Based on our risk assessment, selected two IT projects for evaluation: SFS and Connect project managed by SIS&T for Student Affairs.
- Evaluated processes in place to estimate, charge, track, and report project costs to determine whether they are sufficient to help monitor and control costs; ensure proper project management; and are consistent with applicable UC and UCSB policies, procedures, and guidance, as well as best practices promoted by the GAO.
- Determined the accuracy of reported cost by reconciling total cost reported during the period evaluated with the general ledger.
- Performed detailed testing of a sample of project costs to determine whether:
 - Costs were relevant to the project (e.g. included in the project budget) and reported in the proper cost category.
 - The amount and types of costs were fully supported by the supporting documentation.
 - The supporting documentation was appropriate for the type of costs.
 - Underlying contracts or purchase orders were in place, current, and otherwise appropriate.
 - Rates and prices were correct per applicable contracts, purchase orders, payroll records, and other sources.
 - Quantities charged to the project were consistent with the invoices or other source documents.
 - There was sufficient documentation that goods and services were approved by authorized personnel and were appropriately received and signed for.

This audit was conducted in conformance with the *International Standards for the Professional Practice of Internal Auditing*.

BACKGROUND

Project Cost Management is a method to measure cost and productivity through the full life cycle of enterprise-level projects. Beginning with estimating, actual historical data is used to accurately plan all aspects of the project. As the project continues, data from the estimate and other information is used to measure the cost and progress of the project. From project initiation to completion, the objective of project cost management is to deliver projects in a cost-effective manner.

| Table 1 | | Relevant Work by UCSB Audit and Advisory Services | |
|--|--|--|--|
| Report Name | | Date | |
| Enterprise and Campus-wide IT Project Costs Fiscal Year 2015-16 Review | | August 17, 2016 | |
| Enterprise and Campus-wide IT Project Costs | | April 23, 2015 | |

Source: Audit & Advisory Services.

Best practices literature¹ describes common difficulties in cost estimating, including:

- Exclusion of known costs without adequate or valid justification.
- Use of historical cost data for computing estimates that is invalid, unreliable, or not representative.
- Not providing for inflation, or not uniformly treating inflation when it is included.
- Low estimates.

The cost estimating process should include the following:

- Defining a project plan.
- Determining the structure and breakdown of the work.
- Identifying ground rules and assumptions.
- Determining cost elements.
- Documenting the process.
- Reporting on updates to estimates.

Cost analysis is used to develop cost estimates and is defined as the effort to develop, analyze, and document cost estimates with analytical approaches and techniques; it is a tool for evaluating resource requirements at key milestones and decision points.

UC Policy IS-10, Systems Development Standards

Policy IS-10, *Systems Development Standards*, describes standards for developing and maintaining computer applications for administrative purposes. These standards apply to any department or vendor engaged by the campus that undertakes development, installation, or maintenance of administrative applications. Table 5 lists the areas covered by these standards, which include regular status reporting and timekeeping.

Policy IS-10 includes the following requirements:

- A single entity must be assigned clear ownership of the project and be made responsible for making key decisions, such as determining budget changes. The policy also recommends having a project plan as part of project management to reduce the likelihood of major, unexpected cost overruns.
- Projects that require more than one year to develop and implement, or more than \$100,000 in cost, must have a project plan, unless an exception is granted.

¹ GAO Cost Estimating and Assessment Guide – GAO-09-3SP

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- The “administrative computing department” may require staff to report their time by project to their manager.

UCSB IT Projects²

Student Financial System Project (SFS)

SFS began in 2013 with the goal of creating an integrated financial system for both the Office of Financial Aid and Scholarships and the Graduate Division. See Table 2 for the most recent budget update.

| Table 2 SFS Budget FY 17-18 as of June 30, 2018¹ | |
|--|---------------|
| Contribution Source | Amount |
| VCSA Contributions to SFS Project | |
| Temp Allocation | \$567,341 |
| Total VCSA per Fiscal Year | \$567,341 |
| Cumulative VCSA Contribution | \$2,540,689 |
| UCSB Contributions to SFS Project | |
| Campus Match- Budget Office | \$1,000,000 |
| Total UCSB per Fiscal Year | \$1,000,000 |
| Cumulative UCSB Contribution | \$1,000,000 |
| Cumulative Project Expense | Amount |
| Total Project Funding | \$1,567,341 |
| Total Cumulative Funding | \$3,540,689 |
| Carry Forward from FY 16-17 | \$1,077,810 |
| Actual/Projected Expenses FY 17-18 | \$488,135 |
| Cumulative Project Expense | \$3,539,293 |
| Balance FY 17-18 | \$1,380 |
| Surplus/Deficit² | Amount |
| Initial Proposed Budget | \$3,582,413 |
| Increase in Cost | \$27,119 |

Source: SIS&T.

1: Approximate.

2: Currently in negotiations to clear the deficit and obtain more funding.

The Office of Financial Aid and Scholarships processes over \$300 million in student loans, grants and scholarships for more than 16,000 UCSB students while keeping in compliance with federal, state and university regulations and guidelines. The current UCSB financial aid system consists of three major components: a homegrown information system called WAVE, the Department of Education software called EDEXpress, and a student and staff financial aid web portal called FAWeb.

Graduate Division’s financial support system is responsible for the administration and distribution of over \$50 million annually in Graduate Student Fellowship and Fee Remission support. Funding

² Descriptions are based on information from campus information technology department websites.

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sources include central campus resources, extramural contract and grants, academic department funding including gifts and endowments as well as funding provided by external entities for numerous specialized fellowship programs. Currently, Graduate Division's student financial-support system's homegrown set of functionality is built around Microsoft Access and designed to support a highly manual and inefficient process that relies heavily on institutional knowledge held by key staff members.

Both present student financial systems have dependencies and interdependencies with numerous other campus enterprise systems. Additionally, these systems have dependencies external to campus systems including those of state and federal agencies and UC Office of the President.

An integrated Student Financial System will increase information exchange and intersection between the Graduate Division and the Office of Financial Aid and Scholarships and it shall allow the campus to enhance interoperability, gain operational efficiencies, and improve business processes.

Connect Project for Student Affairs Division (Connect)

From March to May 2018, the Student Affairs Division, Graduate Division, and Arts & Lectures migrated email and other services to Google's G-Suite for Education, known on campus as Google Connect. This move introduced a new suite of Google collaboration and productivity tools, such as Gmail, Calendar, Drive, Docs, Hangouts, Sheets, and more, plus it advanced SIS&T and its partners in a larger campus IT direction to consolidate systems, streamline costs, increase collaboration, and enhance security.

| Table 3 | Selected IT Projects Cost and Schedule Summary as of June 30, 2018. ¹ | |
|--|---|----------------------|
| | SFS | Connect ² |
| Original Project Cost | \$3,580,000 | \$86,000 |
| Current Projected Cost | \$3,600,000 | \$95,379 |
| Increase in Cost | \$20,000 | \$9,379 |
| Original Completion | February 15, 2017 | July 31, 2018 |
| Current Projected / Actual Completion | August 20, 2018 | July 31, 2018 |
| Increase in Timeline | 16 Months | None Expected |

Source: SIS&T.

1: Approximate.

2: Original Project Cost is only consulting services. OCIO agreed to cover \$65,000 of the cost consulting services and transfer the remaining cost to SIST, which is \$21,000.

SUMMARY OPINION

We found that processes in place to accurately charge, track, and report project costs are adequate to help monitor and control costs and ensure proper project management. We did find modest opportunities to enhance current budget reporting to be more comprehensive.

Audit observations and management corrective actions are detailed in the remainder of the audit report.

DETAILED OBSERVATIONS AND MANAGEMENT CORRECTIVE ACTIONS

A. Accuracy of Reported Costs

We found that cost figures reported to management for both projects have been accurate, and that costs charged to each project were relevant to the projects, consistent with underlying contracts, and properly approved. Rates and prices for costs charged to the projects were consistent with relevant contracts or other sources, such as payroll records. The results of our testing are summarized in Table 4.

| Table 4 | Testing of Project Costs | |
|--|---------------------------------|----------------|
| Testing | SFS | Connect |
| Project Costs | | |
| 1. The costs were relevant to the project and reported in the proper cost category. | ✓ | ✓ |
| 2. The cost amount and type of costs agrees with the supporting documentation. | ✓ | ✓ |
| 3. The supporting documentation is appropriate for the type of costs. | ✓ | ✓ |
| 4. Underlying contracts or purchase orders were in place, current, and otherwise appropriate. | ✓ | ✓ |
| 5. Rates and prices are correct per applicable contracts, purchase orders, payroll records, and other sources. | ✓ | ✓ |
| 6. Quantities charged to the project are consistent with the invoices or other source documents. | ✓ | ✓ |
| 7. There is evidence the goods and/or services were received/signed for. | ✓ | ✓ |
| 8. The purchase or other transaction was properly approved. | ✓ | ✓ |
| Accuracy of Reported Cost Figures (Reporting vs. General Ledger) | | |
| Results | ✓ | N/A |

Source: Auditor analysis.

✓: Full compliance.

N/A: Test could not be performed due to lack of internal reports with budget information because of a fixed budget.

B. Practices for Estimating and Tracking Project Costs

Our review determined that practices for estimating and tracking project costs are overall aligned with UC Policy IS-10 and best practices. Table 5 summarizes the results of our evaluation.

Estimating Project Costs

We determined there is a methodology for estimating both SFS and Connect project costs that includes a risk assessment, sizing, cost elements, assumptions, documentation, and any cost estimation updates as appropriate. This methodology is documented indirectly through several steps:

- SFS methodology for estimating project costs includes close collaboration among relevant IT managers, regular project status updates to the SFS Steering Committee, use of historical

data, and vendor proposals, among other steps. We were also informed that parametric and analogous estimation techniques³ were used in estimating the project costs.

- Connect project costs are principally comprised of vendors and consultants responsible for the majority of the project. The initial cost estimate was developed through SIS&T and the Office of the Chief Information Officer (OCIO) collaboration. Factors for developing the estimate included end-user surveys, vendor proposals, use of historical data, and estimations of staffing and timeline, among other elements.

| Table 5 Practices for Estimating and Tracking Project Costs | | |
|--|------------|----------------|
| Policies and Best Practices | SFS | Connect |
| GAO Cost Estimating and Assessment Guide, GAO-09-3SP | | |
| Formal Risk Assessment | ✓ | ✓ |
| Sizing Method | ✓ | ✓ |
| Element of Cost (Number of licenses, infrastructure, personnel/labor, training, support, and others) | ✓ | ✓ |
| Assumptions for Estimating Project Cost ¹ | ✓ | ✓ |
| Formal Documentation | ✓ | ✓ |
| Cost Estimation Updates | ✓ | ✓ |
| Policy IS-10, Systems Development Standards | | |
| Regular Status Reporting | ✓ | Partial |
| Employee Time Reporting | ✓ | ✓ |

Source: Auditor analysis.
 ✓: Full compliance with selected requirement and/or best practices.
 Partial: Opportunities to enhance compliance with selected requirement and/or best practices. Budget information is not included in regular status reporting because of a fixed budget.
 1: Defines what the estimate includes and excludes.

Tracking Project Costs

We found that both projects have adequate processes in place overall to accurately charge, track, and report project costs. However, we observed potential opportunities to provide more comprehensive budget reporting:

- SFS employee hours were included as part of the initial budget projection and have been continually tracked throughout the duration of the project. However, other than the initial budget projection, employee hours have not been included in subsequent project cost updates as part of the labor cost.

³ Project management techniques that use past projects as a basis to estimate how long a current project will take and how much it will cost. Unlike analogous estimation, parametric estimation uses scalable variables (units, rates, etc.)

C. SFS Funding Process

Through the course of our work, we learned that the SFS project has not been fully funded for the past four years based on the projected budget. We observed that annual contributions by stakeholders have remained fixed despite increasing projected expenses, leading to carry forward which was eliminated by June 30, 2018. The estimated project deficit will be \$27,000, or 0.75% of the initial proposed budget. This deficit arose from expanding the scope to include the graduate student financial system module within the SFS.

We recommend Student Information Systems & Technology evaluate instituting more comprehensive budget reporting that includes internal costs, such as campus labor.

Management Corrective Actions

Student Information Systems & Technology will evaluate instituting more comprehensive budget reporting that includes internal costs, such as campus labor.

Audit and Advisory Services will follow up on the status of these issues by November 1, 2018.