UCSB Audit and Advisory Services

Internal Audit Report

Enterprise and Campus-wide IT Project Costs

April 23, 2015

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Report No. 08-15-0002

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April 23, 2015

To: Elise Meyer, Director, Business Operations & Planning
Enterprise Technology Services

Re: **Enterprise and Campus-wide IT Project Costs**
Audit Report No. 08-15-0002

As part of the 2014-15 annual audit services plan, Audit and Advisory Services has completed an audit of IT project costs. Enclosed is the report detailing the results of our review.

The primary 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 and UCSB policies, procedures, and guidance. The scope of this audit was limited to the Kronos and Connect projects; however, this audit is the first in a series of planned annual audits of costs charged to major campus IT projects, and it is anticipated that future audits will cover other projects.

We found that cost figures reported to management for the Kronos and Connect projects have been accurate overall, and that costs charged to the projects were appropriate, consistent with underlying contracts and purchase orders, and properly documented and approved. However, this report recommends a management action plan that addresses a more formal project plan and budget for Connect; written procedures that address consistent treatment of expenses, required approvals, and supporting documentation for costs; and other project accounting and reporting subjects; as well as measures to facilitate better management of project costs.

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 Enterprise Technology Services personnel during the review. If you have any questions, please feel free to contact me.

Respectfully submitted,

Robert Tarsia
Director
Audit and Advisory Services

Enclosure

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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 2014-15 audit services plan of UCSB Audit and Advisory Services. The audit is the first 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 Electronic Timekeeping (Kronos) Project and the Connect communication and collaboration service project (e-mail and calendaring). We selected these projects based on a risk assessment of enterprise and campus-wide IT projects that considered project size, complexity, status, timeline changes, cost increases, and other factors. We selected samples of transactions from the period July 1, 2013, through June 30, 2014, 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 (e.g. included in the project budget).

- Underlying contracts or purchase orders were in place, current, and otherwise appropriate.

- Rates, prices, and quantities charged are correct.

- Goods and services were approved by authorized personnel.

To accomplish our objectives, we:

- 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.
    - *Project Cost Management,* a project cost guide published by The Project Management Institute Inc. (PMI).

  - *Cost Estimating,* an IT project cost guide published by ALON, Inc., a firm specializing in program management support for IT and support programs for the federal government.
  - *Auditing IT Projects,* an audit guide published by the Institute of Internal auditors (IIA).

- Interviewed key campus IT personnel to gain an understanding of campus practices for managing IT project costs.

- Performed a risk assessment of current projects that considered project size, complexity, status, timeline changes, cost increases, and the results of our interviews and observations.

- Based on our risk assessment, selected two IT projects for evaluation: Kronos and Connect.

- 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 Government Accountability Office (GAO) and other organizations.

- Determined the accuracy of reported cost figures by reconciling figures from cost reports 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. Project cost management processes are summarized in Table 1.

Best practices literature[1] describes common difficulties in cost estimating, including:

- Exclusion of known costs without adequate or valid justification.

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

- 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 estimate.

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.

Table 1 Project Cost Processes

Process	Project Phase	Key Deliverables
Plan Cost Management	Planning	N/A
Estimate Cost	Planning	Activity cost estimates, basis of estimates
Determine Budget	Planning	Cost performance baseline
Control Cost	Monitoring and Controlling	Work performance

Source: A Guide to the Project Management Body of Knowledge (PMBOK Guide)

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 4 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.

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

UCSB IT Projects

Major campus IT projects include the following[2]:

- The *Financial System Implementation Project (*FSIP) will modernize the campus financial system, move existing systems off the mainframe, and improve strategic alignment with the UCPath system. A new financial system is also needed because the current system is written in older programming languages and is coexisting with outdated versions of the supporting vendor software, placing the ongoing operation of the current system in jeopardy. FSIP Phase 1 encompasses deployment of general ledger, chart of accounts, commitment control (budget), accounts payable, asset management, and project costing modules, as well as relevant interfaces with campus shadow systems. Phase 2 includes the deployment of contracts, grants management, billing, and accounts receivable solutions, as well as business process redesign/improvements and required integration with other key campus systems.

- The *Student Information Systems Modernization Project (SIS Modernization)* is modernizing the campus student information systems. In early 2007, a strategic planning group was formed to analyze the risks associated with the aging student systems and suggest alternatives for replacement. Management subsequently decided to convert the systems to a modern platform, utilizing external vendors and a division of technical personnel. The project was divided into three phases: Conversion, Stabilization, and Modernization. The first phase of the project involved the conversion of 18 student information systems used by the Student Affairs Division, academic and other campus administrative offices, and current and prospective UCSB students. The project is currently completing the Modernization phase.

- *UCPath* is a UC Office of the President project. The goal of the project is to deploy a single payroll system and a single human resources system across all ten campuses and five medical centers that meets the core needs of each location, while capturing the efficiencies, improved data, and cost-savings associated with unified systems. The UC Office of the President chose the Oracle PeopleSoft HCMS platform for UCPath. UCSB's Enterprise IT Project Management Office (PMO), part of Enterprise Technology Services (ETS), is responsible for leading the campus UCPath implementation. The current projected cost included in Table 2 is based on an October 2016 go-live date. ETS is developing a new budget and forecast based on a go-live date in spring or summer of 2017.

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

- The *Electronic Timekeeping (Kronos)* project will replace UCSB's outdated, mostly paper-based, timekeeping processes. Moving to an electronic timekeeping system will result in savings from the elimination of paper timecards and manual data input of information into the Payroll Personnel System (PPS). When completed, employee time and attendance information will be gathered electronically and automatically exported to the campus payroll system.

- *Connect* is a UCSB communication and collaboration service. The core communication components include e-mail, calendaring, contacts, tasks, and mailing lists. According to ETS, Connect Phase 1 was suspended in December 2013, and ETS has been in a maintenance mode for the existing deployment while exploring options for moving forward.

Responsibility for FSIP, UCPath, and Kronos originated with the Administrative Services Division. ETS assumed responsibility for these projects after its creation in October 2013. The actual transition of financial responsibility for Kronos occurred in April 2014.

Table 2 **Campus IT Projects Cost and Schedule Summary**

	Kronos[1]	Connect[2]	FSIP Phase 1[3]	SIS	UCPath[4]
Original Planned Cost	$1,892,497	$127,000/ Year	$11,336,880	$14,674,500	$8,053,914
Current Projected Cost	$3,653,972	TBD	$19,151,796	$14,291,982	$12,834,935
Increase in Cost	93%	N/A	68%	-2.6%	59%
Original Completion	December 2014	September 2013	October 2013	February 2013	July 2015
Current Projected / Actual Completion	April 2016	TBD	December 2015	September 2013	April 2017
Increase in Timeline	16 months	N/A	26 months	7 months	21 months
No. of Audits and Advisory Projects	None	None	4	3	2

Sources: ETS and SIS&T
1. Original planned cost reported to the IT Council & Coordinating Committee on Budget Strategy in fall 2013; current projected cost is as of April 15, 2015, as presented to the UCPath/Kronos project sponsors. Current projected completion is based on a new project plan.
2. Original cost figure does not include one-time costs of $50,000 absorbed by existing ETS budget.
3. Current projected completion date includes stabilization period following July 1, 2015, cutover.
4. Original planned cost presented to the Chancellor on August 30, 2013; current projected cost is as presented to the UCPath/Kronos project sponsors on February 18, 2015. Current projected completion date includes stabilization period following October 2016 cutover.

SUMMARY OPINION

We found that cost figures reported to management for the Kronos and Connect projects have been accurate overall, and that costs charged to the projects were appropriate, consistent with underlying contracts and purchase orders, and properly documented and approved. However, this report recommends a management action plan that addresses a more formal project plan and budget for Connect; written procedures that address consistent treatment of expenses for reporting, required approvals and supporting documentation for costs, and other project accounting and reporting subjects; and other measures to facilitate proper management of project costs. Some management practices in these areas have changed since the time covered by this review.

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

Kronos

We found that cost figures reported to management for the Kronos project have been accurate overall, and that costs charged to the project were relevant to the project, consistent with underlying contracts and purchase orders, and properly documented and approved.

We did identify some opportunities for improvement:

- There was some inconsistency in the classification of costs between the general ledger and reported costs. For example, some costs reported as consulting were classified in the general ledger as operational maintenance costs by the previous project team, and some equipment items were classified as office supplies.

- Required supporting documentation for each type of cost should be defined and consistent, especially for recurring internal costs.[3]

Connect

We found that total Connect cost figures reported to management have also been accurate overall, and that costs charged to the project were relevant to the project, consistent with underlying contracts and purchase orders, and properly documented and approved.

We did identify some opportunities for improvement:

- As discussed in the next section, the project has not had a formal project plan with a defined budget project. Reported project costs have included operational costs, such as software licenses and maintenance services, that should be separated from project costs using specified assumptions and criteria. This would improve project management's ability to accurately track, report, monitor, and control project costs.

- The project does not have dedicated cost centers and/or account-funds. Connect shares cost centers and account-funds with the operational costs of campus email, Oracle Corporate Time, and identity management. Therefore, project costs have to be identified manually in the general ledger, a process that makes accurate reporting more difficult.

[3] Technology infrastructure fees and liability insurance.

Table 3 Testing of Project Costs

Testing	Kronos	Connect
Project Costs		
1. The costs were relevant to the project (e.g. included in the project budget) and reported in the proper cost category.	Minor misclassification of cost categories.	N/A [1]
2. The cost amount and type of costs agrees with the supporting documentation.	✓	✓
3. The supporting documentation is appropriate for the type of costs.	✓ [2]	N/A [1]
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.	Documentation procedures should be defined.	✓
8. The purchase or other transaction was properly approved.	Approval procedures should be defined.	
Accuracy of Reported Cost Figures (Reporting vs. General Ledger)		
Results	✓	✓

Source: Auditor analysis
✓: Full compliance
1: As discussed in the body of the report, the project plan and budget should be properly documented to ensure costs are fully auditable.
2: Project documentation procedures for recurring costs need to be developed.

B. Practices for Estimating and Tracking Project Costs

Our review highlighted opportunities to enhance practices for estimating and tracking project costs to help ensure alignment with Policy IS-10 and best practices. Table 4 summarizes the results of our evaluation.

Estimating Project Costs

Cost estimation has been mainly based on project managers' expertise. The estimation process has not been methodically documented and supported by a formal methodology as best practices recommend.

- Cost estimation for Kronos has not included a formal risk assessment, documentation regarding software sizing, or references to data used for calculation.

- Cost estimation for Connect has included elements of cost (such as number of licenses), infrastructure costs, and a risk assessment. However, there is no formal documentation of the steps used to develop the estimate, methodology, assumptions, ground rules, comparisons to previous estimates, or regular updates of documentation. We also did not receive supporting documentation for project approvals, which would include approval of the cost estimate.

Table 4 Practices for Estimating and Tracking Project Costs

Policies and Best Practices	Kronos	Connect
Policy IS-10, Systems Development Standards		
Regular Status Reporting	✓	×
Project Timekeeping	✓	Allocated [1]
Government Accountability Office GAO-09-3SP		
Formal Risk Assessment	×	At the beginning of the project
Sizing Method [2]	Number of users	Number of users
Element of Cost (Number of licenses, infrastructure, personnel/labor, training, support, and others)	Partial	Partial
Assumptions for Estimating Project Cost [3]	✓	✓
Formal Documentation	Partial	×
Cost Estimation Updates	Budget only	×

Source: Auditor analysis
✓: Full compliance with selected requirement and/or best practices.
×: No or very limited compliance with selected requirement and/or best practices.
Partial: Partial compliance with selected requirement and/or best practices.
1: Estimated, but not periodically evaluated and tracked.
2: e.g. Lines of source code, number of users, function point, and others.
3: Defines what the estimate includes and excludes.

Tracking Project Costs

We found that the:

- Kronos project has adequate processes in place to accurately charge, track, and report project costs that are sufficient to monitor and control costs.

- Connect project has not had processes in place to charge, track, and report project costs that are sufficient to monitor and control costs. The project has not had a formal project plan with a defined budget, and there have not been regular project status updates. The project has also allocated internal personnel costs, and has not tracked or updated the allocation to ensure its ongoing accuracy, as Policy IS-10 recommends.

We recommend drafting and implementing a management action plan that addresses the following:

Kronos:

- Formalize and document the basis of project cost estimates going forward, to provide a better foundation for tracking, reporting, and managing the cost of the project.

Connect:

- Formalize key processes such as project plans and budgets.
- Dedicated cost centers and/or account-funds to facilitate accurate project cost reporting.
- Regular status reporting of project costs.
- Employee time reporting or another method to measure staff time devoted to the project, and periodic comparison with estimates of staff time.

Both Projects:

Written procedures that address consistent treatment of expenses for reporting purposes, required approvals and supporting documentation for each type of cost, and other project accounting and reporting subjects.

Management Corrective Actions

ETS will draft and implement a management action plan that includes:

Kronos:

- Formalizing and documenting the basis of project cost estimates going forward.
- Written procedures that address:
    - Consistent treatment of expenses for reporting purposes.
    - Consistent invoice approval.
    - Supporting documentation for all received items.

Existing Connect Service:

- Using dedicated cost centers and/or account-funds to facilitate accurate project cost reporting.
- Employee time reporting or another method to measure staff time devoted to the project, and periodic comparison with estimates of staff time.
- Written procedures that address:
    - Consistent treatment of expenses for reporting purposes.
    - Consistent invoice approval.
    - Supporting documentation for all received items.

Future Connect Project:

- Formalizing key processes such as project plans and budgets.
- Regular status reporting of project costs and forecasts.

Audit and Advisory Services will follow up on the status of these issues by September 30, 2015.