




Effective Use of Data Mining Tools in Audits

Tom Poon, Senior Assoc. Director, San Francisco
Mike Lee, Staff Auditor, San Francisco
Laura Bishin, Principal Auditor, Riverside







What are CAATs?

Computer Assisted Auditing Techniques (CAATs) and Data Analytics Tools include:


- ACL (Audit Control Language)
- Brio
- IDEA (Interactive Data Extraction & Analysis)
- Microsoft Excel
- Microsoft Access
- SQL & Other Reporting/Query Tools






What can CAATs do?


- CAATs can enhance audit projects by:
 - Allowing for increased scope coverage
 - Broader samples
 - Identifying exceptions
 - Trending analysis
 - Producing scripts for continuous monitoring/process automation for clients
 - Direct access to data






Case Examples


1. Effort Reporting (UCSF)
2. Mission Bay Hospital Construction Project - Invoice Validation Process Automation (UCSF)
3. Contracts & Grants (UCR)
4. Travel & Entertainment (UCR)
5. Conflict of Interest (UCR)






Case #1: UC San Francisco


SOM EFFORT REPORTING SUMMARY






Request & Challenges


- Request from School of Medicine Dean to provide a summary of FY11 effort reported by the SOM department faculty and students/postdocs to sponsored and non-sponsored awards.
- ERS Data is housed in OP's Hosted Applications Group – required significant effort and coordination to define the criteria for data request.
- Data does not contain hierarchical departmental information, title codes or definitions of Core/Non-Core Faculty.

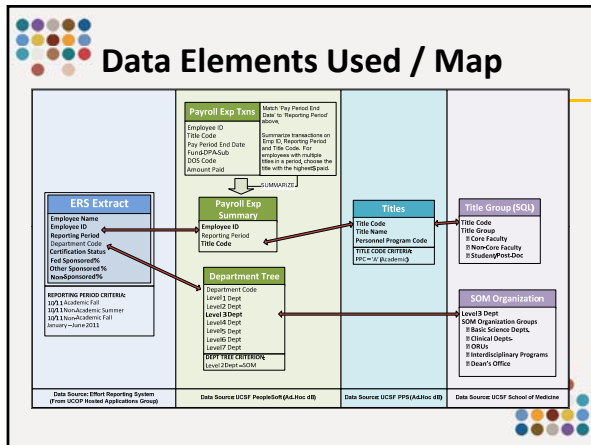





Solution & Results

- Combined data from various sources to produce a report:
 - ERS extract for all SOM departments from OP Hosted Applications Group
 - Summarize Distribution of Payroll Expense reports to determine employees' primary title code for the scope period.
 - SQL Query provided by SOM to determine 'Core Faculty', 'Non-Core faculty', student and postdoc title codes.
 - Payroll and Personnel Systems to determine departmental roll-up information.









Case 2: UC San Francisco

MB HOSPITAL INVOICE PROCESSING


AUTOMATION USING VBA






Request


- Create an automated process that will reduce the need for manual invoice verification.
- Monthly verification of 15 of invoices from 9 sub-contractor by 2 Project Accountants that includes :
 - Validate the labor invoices for missing information, calculation errors, etc.
 - Identify employees with charged rates that do not match agreed-upon contract rates based on job classification or over-scale pay agreements.
 - General summary of overtime hours worked and the premium pay totals by work week & subcontractor






Challenges


- Soft-copy invoices are provided by subcontractors that do not conform to standard format. Many formatting inconsistencies & errors (e.g. spelling, missing fields, etc.)
- Large number of over-scale employees and apprentices receiving part-time pay.
- Rates change at least every 6 months (requires an easier way to update the key tables)






Proposal: Excel VBA Template

- Created an Excel template with built-in visual basic scripts.
 - ACL, IDEA and Access are far less forgiving of non-standardized data.
 - Easier learning curve for the clients – more people are already familiar with Excel
 - Password-protected key-tables (rate tables and overscale employees) are relatively secure and easier to maintain



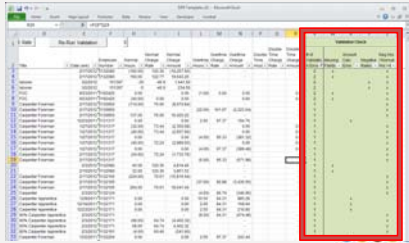



Step 1: Data Validation

Data validation macro cleans up the soft-copy invoices and checks for instances of:

- Missing fields
- Amount calculation errors
- Negative rates
- Adjustments (e.g. negative or >40 hours)

Allows users to make changes directly.

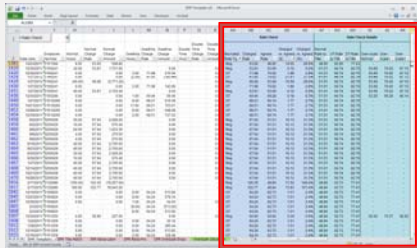





Step 2: Rate Checks

Rate check macro then tests the cleaned invoices to identify:

- Mismatches between charged rates and agreed rate by title.
- Mismatches between charged rates and over-scale rates by employee







Step 3: Overtime Tracking

Once the rates are verified, the macro produces an overtime report that includes:

- Summary of total overtime and double-time hours worked by work week
- The total 'premium' pay for the work week
– (OT/DT rate – REG rate)*OT/DT hours worked






Case 3: UC Riverside

CONTRACTS & GRANTS

EVOLUTION TOWARDS CONTINUOUS MONITORING






Contract & Grants Reports

We produced this information for our audits, but the units didn't have such information readily available:

- Deficit Trend and Aging Reports
- Transactions after Fund End Date
- Cost Transfers Reports

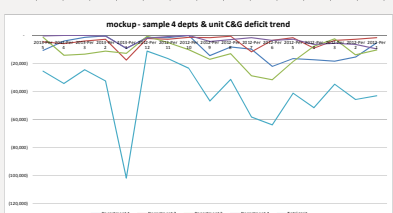

Units became very interested in our reports!!!




C&G – Deficit Trend Report

Month	2012-Per	2012-Per	2012-Per	2012-Per	2012-Per	2012-Per	2012-Per	2012-Per	2012-Per	2012-Per	2012-Per	2012-Per	2012-Per	2012-Per	2012-Per	2012-Per	2012-Per
Department 1	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Department 2	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Department 3	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
Department 4	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
Total	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000




C&G – Deficit Aging

Deficit Aging from Fund End Date Analysis
As of Date: 9/30/2010


Mock Sample Department


Fund	Fund End	Current Closed Period 3 FY 2011	1 - 6 Months	7 - 11 Months	1 Year	2 Years	3 Years	4 Years	5 Years	Dept. Total Deficits
12345	9/30/2009	-	-	-	(518)	-	-	-	-	(518)
12346	7/31/2010	-	(921)	-	-	-	-	-	-	(921)
12347	7/31/2010	-	(4,495)	-	-	-	-	-	-	(4,495)
12348	8/31/2010	-	(138)	-	-	-	-	-	-	(138)
12349	9/28/2010	(1,016)	-	-	-	-	-	-	-	(1,016)
12350	9/28/2010	(2,548)	-	-	-	-	-	-	-	(2,548)
12351	10/31/2010	(20,321)	-	-	-	-	-	-	-	(20,321)
12352	3/7/2011	(1,645)	-	-	-	-	-	-	-	(1,645)
12353	6/30/2011	(889)	-	-	-	-	-	-	-	(889)
12354	3/31/2012	(26,669)	-	-	-	-	-	-	-	(26,669)
Total		(53,088)	(5,555)	-	(518)	-	-	-	-	(59,160)



Case 4: UC Riverside


TRAVEL & ENTERTAINMENT


- 
- ### Travel & Entertainment
- Travel > 21 days
 - Number of days travel voucher is in system before final approval
 - Stats on rejects (Departmental vs AP)
 - Transient Occupancy Tax
 - Premium Parking
 - Meals pushing max daily cap
 - Final approver doesn't report to traveler



Case 5: UC Riverside

CONFLICT OF INTEREST





Conflict of Interest

- Schedule of Classes to determine who wasn't teaching either all year or most of the year
- Address information - identify non local address
- Faculty on payroll (sabbatical info)
- Cross ref data above & select faculty to test.
- Google search, ratemyprofessor.com, other social media sites (i.e. LinkedIn, Facebook)
- Review Travel & Shipping Expenses
- Review Phone activity (or lack of)

