Projects Out of Control?
Call the C.O.P.S. - Control Over-budget Project Spend

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Introduction

All project-oriented companies want to control project spending. But maintaining Encumbrance Accounting can be time-consuming and still allow over-spending. Focus gets misplaced on manipulating the budgets instead of managing against them. This presentation will share one solution to this problem using transaction controls and a program for manipulating the project status. It will also expand on the idea and explore the importance of management accountability over strict system controls.

Business, encumbered

Comcast Corporation (Nasdaq: CMCSA) is the nation's leading provider of entertainment, information and communications products and services. With 24.1 million cable customers, 13.2 million high- speed Internet customers, and 4.6 million voice customers, Comcast is principally involved in the development, management and operation of broadband cable systems and in the delivery of programming content.   Comcast Cable Communications managed $6.0 billion in capital expenditures across its vast multi-state network in 2007[1]. This spending was all managed using a combination of Oracle Purchasing, Projects and General Ledger's *Encumbrance Accounting* feature.

Encumbrance Accounting is a feature enabled in Oracle General Ledger that requires Purchase Orders and Purchase Requisitions to first undergo a funds check when they are submitted. The system checks the line amount(s) of the requested purchase against the budget for the GL account(s) and alerts the user if that PO or Req. will exceed the funds on the account. The system can be configured so that the alert is either a Warning or an Error, stopping processing until the funds are allocated.

The feature is required for federal, many state and other governmental installations, but it is generally not promoted for commercial implementations due to its complexity and business processing problems. Nevertheless, Comcast had such large and distributed capital spending, that it was deemed to be a necessary evil.

Although the encumbrance feature did force new purchase requisitions to check the funds available on the budget, it created some challenges in running the business. These challenges were primarily twofold -- delays in procurement and, more importantly, loss of beginning budget information. It also did not perform the funds checking on Issues from Inventory to a project, an activity that became increasingly important as the Supply Chain and Inventory group improved its services.

Why can't I get my stuff?

The most noticeable negative impact of Encumbrance Accounting was the time spent chasing down budget dollars when an account would hit its threshold. As a practical matter, the technicians who were requesting material were not the same ones who were managing the budget. So even if division

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[1] Source: Comcast Earnings Release, Q4, 2007, www.cmcsa.com

operations managers were reviewing their actual-to-budget reports on a regular basis, the message wasn't getting into the field.

Also, the accounting rules for selecting the proper Expenditure Type (and indirectly, Account number), had been automated and placed behind the scenes as part of an earlier improvement.[2] The end result was that purchase requisitions were getting held up throughout the system, as operations, procurement and accounting personnel figured out how much budget money needed to be moved into what accounts and from where. Even had that process been streamlined, it would have exacerbated the next problem, visibility.

Whose budget is it anyway?

The knock-on impact of all this budget movement was that the actual-to-budget reports on capital spending ceased to mean anything at all. Assume a manager had budgeted $1m in a particular account, and suddenly the business exploded in that region. At some point, more money would have to be allocated to that budget to meet demand. As the budget chased the actual spend, the variance would trend to -0-. So at the end of the year, the report would read something like:

Actual	Budgeted	Variance
$1,585	$1,590	$ 5

Instead of the true case of:

Actual	Budgeted	Variance
$1,585	$1,000	$ (585)

This was happening throughout the system. If there was a budget overrun, it wasn't easy to figure out what was driving it or analyze whether the root cause was an increase in business or just ineffective spending. Budget journals were being used to track changes in budgets, but the sheer volume of activity made the reports too confusing. And a reporting solution would not have done anything about the field procurement problem above.

What about inventory and labor cost?

Finally, the GL encumbrance functionality was designed to work with external spending, purchase orders and requisitions. It also was originally intended for checking funds against GL balances, not project budgets (although that feature was recently added in 11i). As Comcast began to make better use of inventory, a greater percentage of the capital project spending was coming from internal inventory transfers, not new requisitions.

Also, the labor costs to be capitalized were coming from ADI uploads that would hit a different capital account. So the project could be over budget based on labor costs, but encumbrance would not stop a new material requisition from going through.

In theory, encumbrance accounting promised a systematized method for controlling spending. In practice it simply stalled the procurement process, while removing visibility and accountability from the management team.

Management accountability

Finally, in early 2007, it was decided that the entire process of capital expenditures needed an overhaul. The system was clearly not aiding management in controlling spending, while at the same time placing a huge burden on the procurement process. The approach for 2008 needed to place more emphasis on management accountability, and less on system-automated enforcement.

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[2] Procurements to Capitalization without heartburn, Chandan & Ryan, OAUG Connection Point® 2005

Comcast took a multi-faceted approach to re-engineering the Capex process. The capital accounts were cleaned up & rearranged; detailed capital reporting was changed to a cash basis; detailed project budgets were made mandatory, and budget transfers were abolished except for projects funded at headquarters.

New reports were created to support this process that clearly showed the makeup of project spending within the capital accounts and also a better picture of actual-to-budget spending within a project, on both a cash and accrual basis. The reports showed what was outstanding on PO's, what had already been booked in AP, and what had already been paid – tying out to the cash basis reporting.

Everything was measured against the fixed budget in the capital accounts. As projects were funded, they would "consume" the fixed budget, and then actual expenses would be measured against the project budgets. Unlike with encumbrance accounting, it was possible for a project to overrun its budget, just as it was now possible for a GL account to have a negative variance. But also unlike the days of encumbrance accounting, managers were told that they would be rigorously held to their numbers.

Although it was agreed that the primary mechanism for controlling spending in 2008 was to become management accountability and reporting, there was still a great deal of hesitancy in going "cold turkey" from the old encumbrance habit. It was perceived that if the new culture of accountability didn't work, the system would allow free reign for anyone with a login to spend as much as they wanted.

The C.O.P.S. solution

A solution to this dilemma was proposed by the team working on the Capex re-engineering project. What if encumbrance accounting could be turned off, but the system could still optionally behave as if it were on? If this new functionality could run on project budgets and be selectable by the divisions, it would allow a trial of the policy changes and a slow roll-out of the new model of accountability. Eventually, the hard system controls could be lifted, and the desired culture of accountability would become more self-policing.

There was only one problem. For such an enhancement to work, it would need to be simple enough to be designed, written and tested in the three months remaining on the project.

Such a design was developed, and is illustrated below. It required just a few simple modifications to a package called by the custom.pll and the creation of a concurrent program to change the status of projects that were over budget. For added flexibility, the error logic was controlled by five custom profile options, one for each of the sources of project spending.

C.O.P.S. High-Level Design
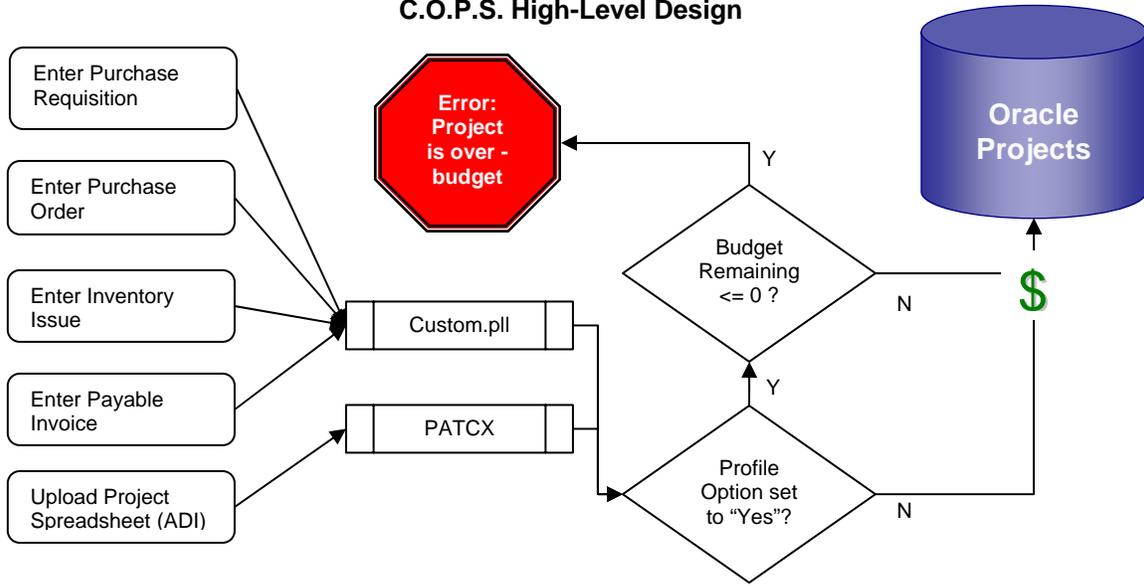
Design

This control is desired as a fallback mechanism to control expenditures on over-budget. This will be an optional control that divisions may choose to use at their discretion. HQ will be responsible for scheduling the underlying concurrent program that will facilitate this control.

Operating Definition of Over-Budget

The Project Variance column on the project summary report will be used to determine if a project is over-budget or not. A negative number in this column indicates an over-budget project. For the purpose of this calculation unpaid invoices are included as actual expenditure.

Global Parameters – What transactions should be stopped?

The following "site" level profile options will be setup to control transactions that are to be prevented if a project is in over-budget status[3].

- **XXPA: Prevent Requisitions on Over-Budget Projects** – This profile option will control whether or not a new requisition may be submitted for an over-budget project. All in-process requisitions will be allowed.

  "New" requisition means a requisition that has not been submitted for approval in Oracle prior to the time project changes status to over-budget. This includes any requisition that may or may not be approved in 'e-form' system if they are not entered and submitted for approval in Oracle prior to status change.

  "In process" requisition means a requisition that has been submitted for approval and is awaiting approval in Oracle prior to the time project changes status to over-budget. This does not include any requisition that may have been submitted for approval in 'e-form' system but not in Oracle.

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[3] Others may, of course, use any naming convention for profile options. Our preference was to err on the side of overly descriptive for future generations of hapless application support specialists.

- **XXPA: Prevent Purchase Orders on Over-Budget Projects** – This profile option will prevent creation of a new purchase order for an over-budget project. Comcast business rules do not allow creation of a purchase order without an underlying requisition. This profile option will prevent creation of a new purchase order even if the underlying requisition is approved.

- **XXPA: Prevent Inventory Issues on Over-Budget Projects** – This profile option will prevent inventory issues to over-budget projects.

- **XXPA: Prevent Project Spreadsheet on Over-Budget Projects** – This profile option will prevent project spreadsheet entries (ADI uploads) such as reclass, etc. on over-budget projects.

- **XXPA: Prevent Unmatched AP Invoices on Over-Budget Projects** – Comcast business rules do not allow any capital AP invoice without a purchase order. This option will only be utilized in the event this business rule is being circumvented. There are additional system controls that prevent posting of an AP invoice to a capital project without matching to purchase order. Any invoices that match to an approved purchase order can be processed normally.

Concurrent Program

The concurrent program will check the budget status of each project that meets the criteria in the Run-time parameters below. If the project is over-budget (i.e. Remaining budget <=0), then it would call the Project Status API to set the status to "Over-Budget". The controls above would be triggered for projects that are in this status.

Run Time Parameters
This program may be scheduled with the following parameters.

- Entity (mandatory) – This parameter will control whether the concurrent program includes projects owned by a single entity (such as 000020) or all entities belonging to an entity rollup (such as SEG000) are included for the purpose of over-budget check and status change.

- Capex Type (optional) – This parameter will control if only the project belonging to a specific capex type are to be included in the run. If no parameter is entered all projects that meet the entity criteria specified with the first parameter will be included in the run.

- Rollback (hidden) – This parameter will allow rollback of status changes to "Approved" for a specific run. Rollback option may be used by support team only. The request id for status change will be stored in a DFF to facilitate this option.

Controls

Enabling the C.O.P.S. program and associated profile options required custom extensions in the following packages:
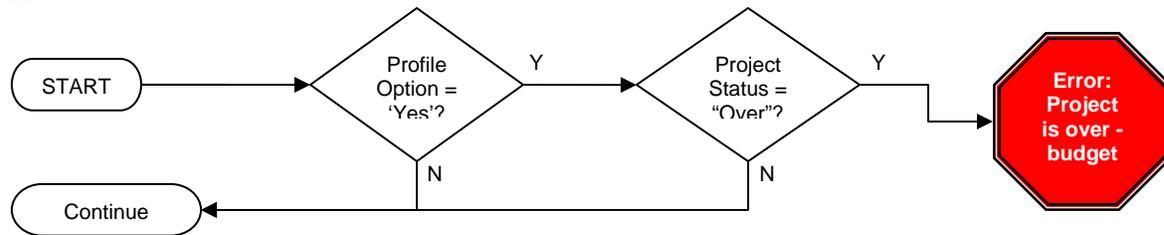- CUSTOM library (custom.pll)
- PA Transaction Control Extension (PATCX)

The custom library is Oracle's supported answer for a customer's need to alter forms. Every time the user navigates through a form -- tab into a field, add a new record, or click a button to open a new form, the CUSTOM.pll logic is run prior to Oracle's logic. Pre-existing code in the custom.pll made a call to custom data validation logic, which was leveraged for executing the C.O.P.S. error functions.

Oracle's PA Transaction Control Extension is one of many project client extensions, which can be used to extend the functionality of Oracle Projects. This allows clients to implement custom business rules in Oracle Projects, without having to customize the software.

The CUSTOM library logic and PA Client Extensions require PL/SQL program logic to be used in specific templates written for each extension.   Once the business design of the extensions are finalized, appropriate PL/SQL must be written and compiled with the provided template. The new procedure is then stored in applications database and is executed when it is called by the forms or, in the case of project client extensions, an Oracle Projects program or function.

The same logic was applied for each of the transactions referenced by the profile options above. This logic was the same for each type of transaction. The only difference was the name of the form or function and the specific profile option that was referenced in the code. The basic logic is outlined below:

```
START ──────►  ◇ Profile        ──Y──►  ◇ Project         ──Y──►  ⬠ Error:
               Option =                  Status =                   Project
               'Yes'?                    "Over"?                    is over -
                 │N                        │N                       budget
                 ▼                         │
Continue ◄──────────────────────────────────
```

The call to check for the Budget Variance was already written into a PL*SQL package that was used for reporting. The code simply made a call to the package and evaluated the result. As mentioned above, this logic was placed in the CUSTOM.pll for the Requisition, P.O., Inventory Misc Transaction and AP Invoice forms. The same logic was written into the PA Transaction Control Extension for Miscellaneous Transactions.

Results

As this paper was being written, only the first month of the new control was being rolled out, so it is too early to gauge the organizational effectiveness of the new capital expenditure process. However, the C.O.P.S. program was successfully tested by the users and project team, and proved to work as designed.

As would be expected, the forms-based calls from CUSTOM.pll were more effective than the PA Transaction Control, simply because the project control is not called until the ADI import program runs, so it is less real-time and doesn't provide an immediate warning. The correct error is appropriately logged in the output file as an exception to the upload.

The C.O.P.S. solution was designed to be an optional aid to help transition Comcast from a culture of system-enforced controls and budget transfers to one of management accountability with system-aided reporting. As of go-live in January, six of the eight divisions and business groups had decided to use it in aiding that transition.

Encumbrance accounting was disabled in December 2007, and 2008 business commenced under the new rules and new Capex accounts.

Post Script: Further Explorations

In any project, the design team discusses many more ideas than they are able to implement. The solution described above is what was actually implemented. This section briefly describes some of the possibilities that were discussed during the design phase and some things to consider for your own requirements.

Selective behavior

For policy reasons at Comcast, the C.O.P.S. program was set up to run on one set of rules at the Site level. But because the controls were built using Profile Options, there is no reason it shouldn't work with a different set of rules at the Responsibility or even User level. This could allow for a single trusted person or small group to act as an "expediter", bypassing the rules based on judgment.

More sophisticated project flagging

Because the controls were built to be sensitive to the project Status flag, the concurrent program could include many more parameters that what was built at Comcast. Some interesting possibilities are:
- Project Type
- Classifications
- Start Dates (to "soft close" ancient projects and see if anyone notices)
- Tolerance ($ or % over budget before status set to "Over-budget")

Error vs. Warning profile options

The profile options were set up to just be "Yes/No", but they could also be set up to be "Error/Warning/ None". Then each of the C.O.P.S. controls could be set independently to behave more like encumbrance controls. Another similar idea is to set them up as numeric fields, representing a threshold.

Conclusion

In conclusion, encumbrance accounting had proven to be a good idea with fatal flaws in both the execution and the philosophy. It produced unintended consequences of making budget management harder and managers less accountable.

C.O.P.S. was simply a technical solution to help ease the transition from the world of encumbrance into a world of fixed budgets, visibility and management accountability.

The experience of Comcast is a cautionary tale to those who would place too much of spending controls within the rules of the procurement and accounting system. True spending control only comes from knowledgeable people who understand how to get a quality job done with a minimum of material and effort. If the system prevents or frustrates **necessary** spending, then well-meaning, customer-focused employees will work around the system.

By making the system controls optional and flexible, Comcast has positioned itself to now promote the real control of management accountability. With meaningful reports and a regular forum to speak to variances, managers up and down the line will know that they are expected to understand those variances and control them, regardless of what the system allows. Having the same reports and definitions of variances from the project level all the way to the boardroom should simplify matters.

And paradoxically, the final value of the C.O.P.S. program will ultimately be judged by how long it will take before it is rendered unnecessary.