Integrated Enterprise Reporting

July 2013

Don McNatty

PROJECT MANAGEMENT SOLUTIONS THAT SIMPLY WORK.
Abstract

“Integrated Reporting” can be accomplished by using reporting and dashboard tools that support accessing multiple data sources directly or through a data warehouse. The data warehouse is the “central” database containing data with differing structures used in producing reports that incorporate the data directly from their auditable source databases. The report/dashboard is supported by programming to align the data based in common elements to provide Enterprise level information, supported by individual system audit reports and without the need for Excel.
Thank you for joining today’s technical webinar

- **Mute** – all call in phones are automatically muted in order to preserve the quality of the audio for all attendees.
- **Questions** – during the session, questions can be submitted through the Questions Box on the right side of the screen. We will try to address your questions at the end of the presentation, time permitting.
- **Follow up** – all registrants will receive an Excel file listing all questions and responses along with a link to the recorded webinar.
Twenty-five + years experience with Primavera

- Oracle Primavera Software
- Oracle Certified Training
- Oracle Certified Implementation Support
- Project Support Services – administrators, schedulers, estimators
- Managed Hosting Services through MLM Project Services
  - Primavera Portfolios, P6 (web), P6 Pro, Contract Management, BI Publisher, Documents, Risk
  - Hard Dollar, Acumen Fuse, Ecosys, Prism G2...
- Subscription based Oracle | Primavera solutions

Business Process Outsourcing

Don McNatty
dmcnatty@drmcnatty.com
Outline

• What is “Integrated Enterprise Reporting”?
• How does it compare to data integration?
• Technologies
• The Reporting Database
• Benefits
• Examples
• Demonstration
• Summary
Integrated Enterprise Reporting

• Data, from multiple sources within the organization...
  – (Often data is silo’d and unconnected)
• Is captured from it’s native structure and formatted, simplified or renamed for easy use in reports...
• Aligned within a reporting database for proper context (time, cost, scope)...
• To provide an integrated dataset for reporting.
• Using a variety of third party report writers, dashboard or graphic tools.
• Easily accessed through a simple web interface.
Data Integration

• Data, from multiple sources within the organization...
  – (Often data is silo’d and unconnected)
• Is passed through “data connectors” and “integration engine” that process and align the data...
• Usually collected into one “primary application” ...
• To provide information both onscreen and in reports.
• Using application specific reporting tools.
• Through application specific interfaces.
• May still need Integrated Enterprise Reporting
Integrated Reporting

PCM DB

P6 DB

SAP DB

Data Collector

Dashboard Tools

Report DB

Web Interface

Users

Report/Dashboard Platform

Integrated Data

PCM DB

Integration Engine

P6 DB

Application Report Tools

Web Application

Users

SAP DB
Technologies

- Some of the examples shown in this presentation used various technologies applied to an Integrated Reporting Platform in our hosted data center.
  - Language: Ruby
  - Framework: Ruby on Rails
  - Database: Postgres/MongoDB/MSSQL/Oracle
  - Standards: HTML5, CSS3, JavaScript and Web Services
  - Web interaction Libraries: HighCharts – Charting, ExtJS – UI/Grid
  - Operating System: Ubuntu Linux 12.04
The Reporting Database

• Gathers information from other database sources as part of an ETL (Extract, Transform and Load) process.
• During this process data can be “flattened” for ease of use and combined from the different sources by linking related pieces of information (for example project information from P6 and Contract Manager).
• Reporting Databases are not “live” databases but are refreshed on a regular basis (for example, daily).
• A reporting database can easily retrieve data from multiple P6 or Contract Management databases.
• Primavera’s P6 Analytics Reporting Database is an example of a Reporting Style of Database that includes P6 data. Non-P6 data can be added to the environment.
Benefits

• Integrated reporting is less costly than full application integration.
• Data in the reporting database is easier to work with for ad-hoc reports.
• Reporting database can support data access security.
• A variety of third party tools are available to access the reporting database directly for specialized output.
• Reports, Dashboards, Analytic data easily accessed through simple web interfaces or devices.
• Output is interactive with “drill-down” capability.
• Audit reports can align with source data.
Examples

• Los Angeles Metro
  – Orange Line Project Summary
  – Measure R Public Dashboards

• Large Utility
  – Dashboards
Orange Line Summary Report

A single page summary report has been created for each of the Major Rail projects and dynamically displays data from P6 and Contract Management related to convey high level project information in a single view.
Orange Line Summary Report

Reports are easily accessed via a custom portlet in the P6 Web Dashboard and users can select the specific project link and launch the report directly from within P6 Web.
Orange Line Summary Report

Summary Report fields for Project Description and Current Status are receiving information from Notebook Topics within P6. This information has the capability to be updated within the P6 Client Application or P6 Web.
Orange Line Summary Report

Report information for Gantt Chart and Project Milestones are updated from schedule information contained within the P6 Summary Schedule. Activity codes are used to identify the proper information and the report consolidates the information for display.
Reporting Structure Architecture

- Primavera PM Database
- Primavera Contract Manager Database
- Accounting/Financial Database
- Reporting Database
  - Example:
  - Primavera ERD
  - Customized Database
  - Data Warehouse
  - Type:
    - MS SQL Server
    - Oracle
    - MS Access
- Reporting Tool
- Interface/Web-Enabled
- Report Users
LA Metro - Dashboards

https://mtadash.mlmprojectservices.com/
### Gold Line Foothill Extension Phase 2A

#### Project Cost Summary (in millions)

<table>
<thead>
<tr>
<th>Phase</th>
<th>Original Budget</th>
<th>Current Budget</th>
<th>Commitment</th>
<th>Cost To Date</th>
<th>Cost Forecast</th>
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<td>$741.0</td>
<td>$593.0</td>
<td>$250.7</td>
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<td>Professional Services</td>
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</table>
Executive Summary

• Designed to provide public-facing website that reports:
  – Status and Performance of Measure R projects
  – Include Cost and Schedule information
• Data published is extracted from existing PMIS systems (P6, Ecosys, FIS)
• Administration system in place to validate and audit information PRIOR to publication, including audit of all review and publication steps.
• Designed for Measure R project portfolio but ready to support additional portfolios of projects.
System Overview

• Web-based system.
  – Javascript utilized, but no Java applets to install
  – Browser-independent for most recent browsers
• Data extractions from PMIS systems are done weekly in automated processes.
• Administration of public-facing data is maintained within the Dashboard system.
Dashboard Design Overview

- Data Sources queried as scheduled services via secure and automated processes
- Review and Publication performed securely on Dashboard Server
- Public only has access to current published dataset
Data Sources

- Cost data—retrieved from Ecosys which includes cost data pulled in from FIS and Primavera Contract Management.
- Schedule data—retrieved from P6.
- Project Status—retrieved from P6.
- Maps—uploaded to Dashboard system.
- Images—uploaded to Dashboard system.
Site Navigation

Simple Breadcrumb navigation

Clickable links in graphs and tables for navigation
Site Navigation--Graphs

Mouse over for key details

Project Duration

<table>
<thead>
<tr>
<th>Project</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold Line Foothill Extension</td>
<td></td>
</tr>
<tr>
<td>Eastside Transit Corridor Phase 2</td>
<td></td>
</tr>
<tr>
<td>Metro Orange Line Extension</td>
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</tr>
<tr>
<td>Westside Subway Extension</td>
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<tr>
<td>Exposition Transit Corridor Phase 2</td>
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<td>South Bay Green Line Extension</td>
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<tr>
<td>Regional Connector Transit Corridor</td>
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<td>Crenshaw/LAX Transit Corridor</td>
<td></td>
</tr>
<tr>
<td>Sepulveda Pass Transit Corridor</td>
<td></td>
</tr>
</tbody>
</table>

Eastside Transit Corridor Phase 2
March 2007 - May 2013

Eastside Transit Corridor Phase 2
5,114.0 million
Site Navigation

Details organized into simple tabs
Site Navigation

Quick navigation to other projects in portfolio

Breadcrumb navigation
Special Features

Print and Export (Save as PDF) option on all Graphs
## Special Features

### Project Cost Summary (in millions)

<table>
<thead>
<tr>
<th>Project</th>
<th>Current Budget</th>
<th>Current Commitment</th>
<th>Actual To Date</th>
<th>Forecast</th>
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<tbody>
<tr>
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<td></td>
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<tr>
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<td>2.8</td>
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<td>4.0</td>
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</tbody>
</table>

Print option on all tabular data.
Special Features

Simple Help pop ups to explain what’s on screen

Exposition Transit Corridor Phase 2

Current Status
The Phase 2 Design-Build contractor, Skanska/Rados continues to advance alternatives for the maintenance facility. URS began mobilization of the E Beatty Infrastructure who provided the lowest responsive bid for the design. Department of Transportation for a shared use parking garage on City of Caltrans. Continued coordination with LADWP and SCE on overhead power project stakeholders. Skanska/Rados continues potholing and pre-construction Canyon Storm Drain. Skanska/Rados continued Preliminary Engineering.
Photo Gallery

Photo Gallery Slideshow option
Administration

• Complete Administration utility to administer, review and publish dashboard data.
• Maintains historical record of published, reviewed, rejected data.
• Users for administration have role-based access assigned.
• Review/Publication process utilizes automated emails to users involved.
## Review and Publication Workflow

### Dashboard Administration—Review and Publication

<table>
<thead>
<tr>
<th>Initiate Review</th>
<th>Review Phase</th>
<th>Publication</th>
<th>Cleanup and Administration</th>
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<tr>
<td><strong>Dashboard Admin</strong></td>
<td>Initiate New Review</td>
<td>Assign Reviewers</td>
<td>REJECT OR CANCEL email to Admin</td>
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<td></td>
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<tr>
<td><strong>Dashboard Publisher</strong></td>
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<td>Receive Email notification when all Reviews are complete</td>
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<tr>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Dashboard Reviewer</strong></td>
<td>Receive Email notification</td>
<td>Review Dashboard and Accept or Reject</td>
<td></td>
</tr>
</tbody>
</table>

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**Note:** This workflow diagram outlines the process for initiating, reviewing, publishing, and cleaning up after a dashboard in the review and publication phase. Each role—Dashboard Admin, Publisher, and Reviewer—plays a specific part in ensuring the workflow is completed efficiently and effectively.
Review and Publish

Datasets selection for review PRIOR to publication

Multiple reviewers status content PRIOR to publication
Role Based Access

User access include Admin, Publisher and Reviewer Roles.

Only Publisher Role has rights to publish data to public dashboard.
Future Options

- Implementation of interactive mapping feature for project maps.
- Dashboard currently ready to implement additional portfolios of projects beyond Measure R.
Utility – Performance Reports

- Portfolio Dashboard
- Schedule Dashboard
- Interactive Control of Display
- Project Listing with Drill Down
- Project Summary Dashboard
- Program Status Dashboard
- Program Funding Dashboard
Portfolio Dashboard
Schedule Dashboard
Interactive Control of Display

| Category | Work Stream | Major Work Category | MAT Code | Capital / Expense | Operatio

| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 2014 |
| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 2012 |
| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 2013 |
| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 2012 |
| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 2011 |
| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 2010 |
| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 2009 |
| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 2008 |
| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 2007 |
| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 2006 |
| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 2005 |
| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 2004 |
| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 2003 |
| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 2002 |
| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 2001 |
| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 2000 |
| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 1999 |
| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 1998 |
| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 1997 |
| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 1996 |
| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 1995 |
| Pipeline | Base Pipe - Small | 73 | Pipeline Cap... | Capital | 1994 |
| Pipeline | Base Pipe - Sma... | 73 | Pipeline Cap... | Capital | 1993 |

## Columns
- Organization
- Financial
- Dates
- Units
- Funding State
- Funding
- EOY Forecast
- Funding Gap
- Variance
- (Funding - EOY Forecast)
- YTD Actuals Closed
- Remaining Forecast
- Authorized
- ITD Actuals
- Variance
- (Authorized - ITD Actuals)
- YTD Actuals
## Project List Dashboard

### Projects Table

<table>
<thead>
<tr>
<th>Project ID</th>
<th>Project Name</th>
<th>Category</th>
<th>Work Stream</th>
<th>Major Work Category</th>
<th>MAT Code</th>
<th>Capital / Expense</th>
<th>Operative Year</th>
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</tbody>
</table>

Drill Down
Project Summary Dashboard

Project Summary

Project #: 30841074
PSRS #: 42

BCA: Michael Ritter (MMK)
Project Manager: Michael Ritter (MMK)
Project Engineer: Michael Ritter (MMK)
Project Analyst: Michael Ritter (MMK)
District / Division: 

Region: 
Category: Transmission - Pipeline
Phase: LAND/PERMITTING
Data Date: 2013-06-01

Status Report

Will need additional funding as construction contract came in higher than anticipated. Need to finalize construction contract so construction can start. Still anticipating an early July start; however dependent on when NTP is issued.

Status Report Archive

30841074: B-153 Dreg4093 Uprate Nakuga Dfm 500 Cap

Project Cost / Financial

0k 100k 200k 300k 400k 500k 600k 800k
Funding  EOY Forecast  Variance  Authorized  Actuals Project To Date  Variance
Program Status Dashboard

- **Projects Funded:**
  - 39
  - Compared to 2013-07-01

- **Projects Over Funded:**
  - 168
  - +19.0% Compared to 2013-07-01

- **Projects Under Funded:**
  - 235
  - -11.5% Compared to 2013-07-01

- **Projects Finishing EDRO This Month:**
  - 17
  - -17.5% Compared to 2013-07-01
Program Funding Dashboard

2013 Funding vs. Forecasted

- Total Funding: $854,346,148.00
- Total YTD Actuals: $214,219,252.00
- % Spent: 35.7%
Demonstration

• LA Metro Public Dashboard

https://mtadash.mlImprojectservices.com/
Summary

• Integrated reporting has proven to be much lower cost than full blown “integration”.
• Integrated reporting can be implemented in much less time than full “integration”.
• A wide variety of third party tools easily brings the latest in interactive, drill-down technologies to web based program, portfolio and project reporting.
• This approach also allowed us to provide project reports to a public audience with full audit/approval workflow.
• This approach has allowed our clients that need the flexibility of multiple databases to accomplish the “Enterprise Reporting” of a single database.
UPCOMING EVENTS

2013 ACUMEN ANNUAL SUMMIT
SEPT 30-OCT 2
HOUSTON, TX

The DRM team is participating in and will have a booth at these upcoming events.
Get updates on the latest news, events and upcoming webinars.
Sign up for our newsletter on our website www.drmcnatty.com