Effective BI Dashboards

Best Practices and worst pitfalls

OAUG Connection Point EPM/BI
5-6 November, 2012

Presented by:
Arun K. Chaturvedi
Business Intelligence Architect
AST Corporation
Agenda

01. Overview

02. Architecture

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06. Dashboards – Pitfalls

07. Summary & Helpful Resources

Q & A
**What is a Dashboard?**

- Core feature of most BI implementations
- Way to present relevant information to users
- Simple to use; that can be spoken to each user
- Can be highly interactive, provide end-users the ability to
  - Drill into data
  - Navigate as per business flow
  - Investigate the results in a personalized way
  - Achieve business objectives

“A dashboard is a visual display of the most important information needed to achieve one or more objectives; consolidated and arranged on a single screen so the information can be monitored at a glance.” - *Stephen Few*
[BI Dashboards] Overview

**Reporting V/S**

- **Transactional**
  - Often refers to operational type of reports
  - Contain frequently changing data
  - Drives more with day-to-day matters

**Analysis**

- **Analytical**
  - Focused on gaining insights that are difficult to pickup on daily dealings
  - Looking at dataset that changes less often
  - Looking for patterns or information over a historical period in an aggregated format
  - Drives more strategic or longer-term decisions
Common Enterprise Information Model

- Common Metadata Foundation across all Data Sources
- Common Security, Access Control, Authorization, Auditing
- Common Request Generation and Optimized Data Access Services
- Common Clustering, Workload Management, & Deployment
- Common Systems & Operational Lifecycle Management
Intelligent Delivery – Powerful user experience, Accurate, Integrated
Business Intelligence Applications

1. Integrates Data for Analysis and Reporting
   Pre-built integration of data from Oracle EBS, PeopleSoft, Siebel, JD Edwards, SAP and other sources into an integrated data warehouse optimized for analysis.

2. Provides User-Friendly Analytic Model of Enterprise Information and Metrics
   - Embedded best practice calculations, metrics, and KPIs
   - Easy for business people to access, analyze, and use the information

3. Delivers Personalized Performance Dashboards for Everyone
   - Thousands of pre-built dashboards, reports, and alerts by business function and role

Customer Insight:
- Accounts
- Region
- Stock
- Sales Rep
- Products
- Product Line
- Bill Size
- Vendor Name
- Vendor Number
- Part Number
- Deal Properties

Oracle Fusion Applications
Oracle E-Business Suite
United States of America
Canada
Japan
San Diego
Austin
Australia
New York
Atlanta
SoCal
Business Intelligence
Chicago
Enterprise Performance Management
Orlando
Australia
Spain
Dallas
New York
Business Intelligence Applications

Interactive Dashboards
Reporting & Publishing
Ad-hoc Analysis
Proactive Alerts
Disconnected Analytics
MS Office Plug-in

Oracle BI EE Suite

Oracle BI Apps built on Oracle BI EE Suite
Packaged ETL Maps
Data Warehouse / Data Mart

ERP (Oracle EBS or others)
Flat File Sources
Other Systems

Metadata
Historical Data
Extract, Transform & Load

Oracle Fusion Applications
United States of America
Oracle E-Business Suite
Canada
Business Intelligence
Japan
Chicago
Enterprise Performance Management
San Diego
Spain
Austin
New York
Seattle
Dallas
Atlanta
SoCal
Dashboards are valuable because they help use relevant, current information to understand how you are performing with respect to your organization's overall goals.
[BI Dashboards] A Quick Look

- **Presentation Catalog**
  - Controlled by presentation service; Managed by web-based tool like Catalog Manager
  - Can be thought of as a comprehensive file management system, which includes folders and files that have attributes such as security controls
  - Files contains XML
  - Tools and features integrated into presentation server
    - Analysis (Answer)
    - Dashboard
    - Actionable Intelligence
    - Office Integration
    - ...
  - Also knows as Web Catalog
Presentation Catalog

- Structure from a user’s perspective
- Users
- Shared
Create Analysis

- [Section] Create ➔ Click on Analysis, [Menu] New ➔ Analysis
- Select Subject Area
- Select columns from fact and dimensions
- Create views, Customize layout, formulas and more…
[BI Dashboards] A Quick Look

- Analysis Editor
  - [Criteria Tab]
    - Subject Areas, Selected Columns, Filters, Catalog
  - [Results Tab]
    - Default View: Compound View
    - Add new views
    - Edit Layout
Create Analysis – Basic Formatting

- Edit View
- Layout/View Editor
  - Toolbar
  - Preview Pane
  - Layout
Save Analysis

- Save
- Save As
- My Folders
- Shared Folders
Create Dashboard

- [Section] Create → Dashboard
Dashboard Builder

- Add, Remove and amend objects that you want in your dashboard
- Drag & Drop
- Preview, Run
- Panes
  - Dashboard Objects
  - Catalog
  - Page Layout
[BI Dashboards] A Quick Look

- **Edit Dashboard**
  - Edit Dashboard; Edit Analysis
  - Controls for Section/Analysis (Top-Right Corner)

- **Add a Page**
  - Add new analysis
  - Rename
  - Reorder
  - Hide/Show

- **Report Links**
Dashboard Prompt

- One Prompt, impact on Multiple Analysis
- Definition Editor
- Types
  - Column Prompt
  - Variable Prompt
  - Image Prompt
- Scope
  - Dashboard
  - Page
Effective Dashboard - Choose only metrics that matters

- Must be relevant to job at hand
- Be highly selective in determining the metrics for your dashboard
- Ask yourself:
  - How does this metric contribute to user’s objectives?
  - Do I have necessary data that can shed light on those objectives?
  - Is this metric really necessary to fulfill those objectives?
  - Can I design a meaningful metric that provide measure for those objectives?
  - Does everyone understand the metric that matters for objectives?

- Start with clear understanding of user’s objective and how you will contribute for those.
Effective Dashboard - Use Visualization

- A picture really is worth a thousand words
- Human brain processes information in ‘Chunks’ – numbers, pictures...
- Process of comprehension and insight is dramatically faster when visualization used
- Instead of instructing users how to read and interpret your views, they can actually focus on what the view in your dashboard are telling them
- Dashboards are meant to be fast and easy to be read and understand
- A well-designed dashboard are more widely accepted by user community
- Use visualization wisely, do not overflow with overly cure widgets:
  - Popular: Bar Graphs, Line Graphs, Heat Maps, Scatter Plots
  - Color, Shapes, thickness, shading, 3D...
[BI Dashboards] Best Practices

- **Effective Dashboard - Make it Interactive**
  - Your dashboard puts all users on the same page
  - Each viewer will have their own questions and areas where they want to know more
  - Your dashboard should allow them to explore so they can get more information they need
  - Use:
    - Guided Navigational Links
    - Conditional Navigational Links
    - Drill-Down
    - Prompts
    - Filters
  - Show them bigger picture on dashboard then give them ability to drill into detailed information they need to get their jobs done

In addition to looking at the Inventory Snapshot by Plant that details information on a Quality basis, it is very important to also understand the dollar value of these quantities. In order to obtain this information please click on the link below.

[Ten 10 Inventory Valuation Report By Plant or Product Type]
Effective Dashboard - Keep it Current and relevant

- Use up-to-date underlying data.
  - Out-of-date data leads to false sense of confidence and then wrong decisions
- Are metrics still reflecting current business challenges?
- Ability to change/update metrics represented in your dashboard
  - User’s focus may change over time as per business needs
Effective Dashboard - KISS (Keep It Simple and Smart)

- Design
  - Start with simple prototype
  - Good understanding of business needs
  - Feedbacks
  - Enhance

- Access:
  - Make your dashboard easily accessible is critical
    - On Web
    - On Blog
    - File Based System – Issue with data synchronization

- Make distribution plan
  - Security
  - Synchronization of underlying data
Effective Dashboard – Be Iterative

- Validate dashboard before distribution
- Test, Test and Test
- Ask for feedback
- Review, Refine, Re-Do
- Learn what people are using then enhance the dashboard that actually matters
  - Usage Tracking
Effective Dashboard – Implement Accessibility

- Not only a good idea – it is a legal requirement in most locations throughout the world
- Do not take all user’s physical skills for granted - mobility in hands, perfect eyesight etc
- The accessibility features support the use of standards-based assistive-technology hardware and software.
- Test BI contents for proper accessibility
- The accessibility features in the OBIEE+ aim to make aspects of navigating and using the product easier for persons with disabilities and for the aging population
  - Features used by third-party assistive-technology products.
  - Content design capabilities that make it possible for content creators to build BI content that supports users with accessibility needs
  - Keyboard shortcuts that make it easier to navigate content for users with limited or no ability to use a mouse

Web Content Accessibility Guidelines 2.0 (WCAG 2.0)
http://www.w3.org/TR/WCAG/

Roadmap for Accessible Rich Internet Applications (WAI-ARIA)
http://www.w3.org/TR/aria-roadmap/

An Oracle White Paper:
A Guide to Accessible Content for Oracle Business Intelligence Suite Enterprise Edition Plus
Effective Dashboard- Design Tips

- Simplify your metrics
  - Arithmetic:
    - Avoid unnecessary detail and arithmetic precision; two digits are the effective limit of mental arithmetic
  - Data aligned in tabular Columns:
    - Data is more easily compared when displayed in columns
- Context:
  - Provide context for the data
  - Compare metrics to baselines, expectations, or averages to avoid deficient measures that is those measures that do not have a clear meaning to the user
  - Consider showing a variance between values to highlight differences rather than showing two sets of discrete values
**Effective Dashboard- Design Tips**

- **Manage Screen Real-Estate**
  - **White-Space:**
    - Although too much information can distract the business user, areas containing a log of white space (too little information) can be just as harmful to the analytic process.
  - **Avoid using overly cute widgets:**
    - Avoid using "glitzy, gimmicky" charts or icons that cause distraction without providing clear detail.
    - Present the results of your requests in graphic or pivot table form, which enhance visualization of the metrics and provide a more intuitive approach to analyzing the data.
  - **Highlight exceptions** to alert the end user that an item requires attention. Do not overuse alerts.
  - **Restrict the use of multiple bright colors** that distract the user.
  - Provide a consistent look and feel on the dashboard.

- **Avoid Scrolling:**

- **Check for screen size/resolution on user’s PCs**
  - Before you start using non standard colors have a look a some color theory: [http://en.wikipedia.org/wiki/Color](http://en.wikipedia.org/wiki/Color), not every color combination does well.
Effective Dashboard- **Design Tips**

**Manage Screen Real-Estate**

- **Logical Grouping:**
  - When multiple requests appear on a single dashboard page, group ‘logically similar’ requests alongside one another, for example profit and revenue, allowing the request group to focus on a single, cohesive storyline.
  - Break apart multiple storylines by function or role, providing optional impact with simplistic presentation.
  - Use pie charts sparingly.
  - Avoid using the 3D chart subtype whenever possible.
  - Examine the placement of queries, following cultural standards- for example, Western cultures read from top-to-bottom and left-to-right. Some cultures read from right-to-left.
Effective Dashboard- **Design Tips**

- **Manage Screen Real-Estate**
  - **Provide ‘Home’ page:**
    - When developing a group of functionally similar dashboards, create a home page that contains a set of links to all other dashboard pages.
    - Ensure that the links are clearly labeled regarding functionality, and contain a clear and concise description for the respective dashboard.
  - Control the number of dashboard pages
  - Provide a clear name for each dashboard page, describing the function of that page
  - Restrict the screen real estate to one column and three sections
  - Prompts and hyperlinks to other dashboards should appear in the top section and report content, gauges, and so forth should appear below the prompts section
Effective Dashboard Design Tips

- Manage Screen Real-Estate
  - Suggestions – Formatting Columns
  - Borders : None
  - Vertical Align : Top
  - Set all padding : 0
  - Width of the columns should be specified in percentages to minimize skewing when viewed using different screen resolutions
  - Set the section to not collapsible
  - Accept the default for all other formatting
  - Name the section to indicate the purpose for that specific section
Effective Dashboard- Usability Tips

- Avoid designing dashboards that return too much data and use overly complex queries
  - When necessary, provide links to other queries to supplement the details.
  - Using drill downs, Guided Navigation, and Conditional Navigation allows the end user to review additional information when they deem it appropriate.

- Ensure that the arithmetic precision of the metrics displayed is appropriate
  - Although the precision should be dictated by the audience, role, and use, typically decimals are displayed for dollar amounts and no seconds for time.

- Include at least one metric in the request/analysis
  - A request should contain at least one metric from a logical fact table.
  - Running a request without any metrics can result in unnecessary joins, yielding poor query performance and system degradation.
  - If you need to run a report without a metric, assign an implicit fact column in the Presentation Catalog from which the request is built.
Effective Dashboard- Usability Tips

- Limit the number of metrics in request/analysis
  - The ideal number of metrics should not exceed 10 in standard table or pivot table and 5 in a chart.
  - For the metrics more than described above, the recommendation is to use column selector view which dynamically filters the columns without cluttering the appearance of the query.

- Remove unused columns from request/analysis
  - The requests should not contain any unused columns as the unused columns:
    - alter the grain of the requests introducing undesirable gaps in the data
    - skewing the request appearance which ultimately impacts query performance
    - consumes valuable screen real estate
Effective Dashboard- Usability Tips

Benchmark KPIs
- Involve users and key executives during requirement gathering and development phase
- Ensure that a solid review of these metrics occurs to eliminate poor decision making and inaccurate forecasts

Saved Selections
- Allows users to view dashboard pages with their “most frequently used” or favorite choices for filters and prompts already pre-selected.
- Eliminates the need to make these choices manually.
- Users can save multiple view selections with different combinations of prompt and filter choices, and switch between them
Effective Dashboard- Usability Tips

- Develop at least two navigation target paths
  - When building navigation paths on a dashboard for an Answers request, a minimum of two distinct target paths should be setup.
    - This allows you to make a clear and decisive decision.
    - One path should be set to detailed report which navigates to the report that shows the most detailed grain for the subject area;
    - while the other path can involve business process navigation or paths to different types of requests that already exist on a dashboard
Effective Dashboard- Technical Tips

- Allow the audience to pose business questions rather than using technical language to derive their metrics
  - Derived information and calculations that reflect a business problem or process can be created using the BI Server to create calculation measure in the Business Model and Mapping layer, which can be built in the Presentation layer using the Expression Builder and Calculation Wizard.
  - Use business terms in presentation layer.
  - Use same name consistently across the subject areas/tables, if they mean same business entity.
- Use intuitive naming conventions and include clear descriptions
  - when creating requests, shared folders, dashboards, dashboard pages, conditional links, and so forth
- Use it for analytical purpose only
  - Cautions should be used if row limits for query results are increased.
  - The Analytic server is a BI tool and should be ideally used for that purpose.
  - It should not be used as a reporting tool to retrieve or download a large volume of data knowingly or unknowingly.
[BI Dashboards] Best Practices

- **Effective Dashboard- Technical Tips**
  - **Monitor row limit increases**
    - This will help eliminate runaway queries
  - **Restrict update**
    - Only administrators should be allowed to modify shared requests and dashboards
  - **Monitor aggregation rule changes**
    - Aggregation rule for metrics are automatically set to "default" which is typically summation or average.
    - When it is necessary to create a non-typical aggregation rule for example a server-complex aggregate metric for % of quota, you should do sparingly
  - **Always validate physical SQL statements generated by each request**
    - Ensure that filters are being applied; fact and dimensions tables are being appropriately accessed and so forth
    - NQQuery.log; Log Levels
Effective Dashboard - Technical Tips

- Mandate Documentation
  - Ensure that every dashboard has a summary description in the catalog along with a stated functional purpose
- Consider using a default template for dashboard design
  - Design templates create a standardized approach for the user environment.
  - The "look and feel" of the dashboard conforms across the enterprise to the established template that governs such items as color, font sizes, logos, and so forth
Effective Dashboard- Technical Tips

Prompts

- Place the prompt section at the top of the page; Center aligned
- Except for the home page of the dashboard, all prompt’s objects should be set with a scope of the Page-level, not Dashboard-level
- When creating a prompt whose value is not dependent on another prompt, de-select the constrain option, it has performance implications of overall prompt execution
- When creating a prompt with a drop-down list option for the control, carefully evaluate the use of the All Choices option
- Avoid using session variables to populate a prompt
- Build multiple prompts, which group objects together by functional domain and limit the data returned. This will limit the number of objects stored in the Presentation Web Catalog

Prompt Layout

- Do not include more than two rows of prompts on a dashboard
- Use consistent color coding
- Group prompts together by function or dimension
- Specify all padding for the column that contains the prompts section=0
Effective Dashboard- Technical Tips

Views
- Unless specifically driven and required by business needs
  - Ensure that all aggregations are maintained at the report level and not in the view
  - Ensure that columns formatting are maintained at the report level and not in the view
- Remove unused views from each report. Removing a view from the Compound view does not delete the view, it simply hides it
- Do not insert HTML code in any view, except for the tags allowed by the static text views
Effective Dashboard - Technical Tips

- **Web Catalog**
  - Remove unused reports from the catalog
  - Do not use special characters in the saved name of request: &, @, %, $, *, +, - etc
  - Create folders and sub folders by functionality, by category – Prompts, Analyses, Dashboards...
Effective Dashboard - Avoid these pitfalls

- Starting with too much complexity
- Distributing metrics no one understands
- Cluttering the dashboard with too much metrics – unimportant, non-relevant
- Waiting for advanced and complex technology to implement
- Underestimating the time and resource to create and maintain dashboards
- Failing to align the metrics to the business goal
- Using ineffective use of color/shapes, poorly designed graphs and charts
You should be highly selective in determining which metrics earn a spot on your dashboard.

Ask yourself how your dashboard metrics connect to the bottom line. Does everyone understand the metrics that matter?
The easier and more intuitive you make the process of customization, the more likely they will be to use your dashboard.
[BI Dashboards] Summary

- Provide insight, not reports
- Protect your real estate and eliminate the white space
- Trust your users will get it
- Merge business skills into your IT skills
- Design your dashboard (and insight) in Oracle BI itself using an iterative methodology
- Be prepared to review, refine, and re-do
If you haven’t yet started a dashboard to help achieve your corporate objectives, get started today. Seeing your data as key metrics on a dashboard will help you march towards meeting your goals.

Resources/References
- Oracle BI EE Documentation URL (OTN)
- OBE - Oracle By Example (OTN)
- White Papers, Blogs and more...
- But, Never forget your best friend...
Contact Information

Arun K. Chaturvedi
Business Intelligence Architect
Email: achaturv@astcorporation.com
Phone: 630-778-1180

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