

Assessment Summary
OIT-OAKS EPM
Assessment

April 8, 2009

SUPPLEMENT TWO – 0A1056

Table of Contents

Document Revision History.....	4
Executive Summary	5
Introduction	8
Purpose	8
Scope	8
Key Drivers.....	8
Objectives.....	8
Context.....	8
Org Chart.....	10
OAKS Steering Committee.....	10
Assessment Approach	10
OAKS EPM Mission Statement.....	12
Findings.....	14
Overview	14
Interview Results	15
Concerns	15
Data Quality.....	22
Performance.....	24
Usability.....	25
Functionality.....	26
Support.....	27
Availability.....	28
Business Requirements.....	28
Organizational Assessment	33
BI Capability Assessment.....	33
Business Integration	35
Data Architecture.....	36
Technical Architecture.....	38
Support Processes.....	39
Development	40
Organization	41
Technical Assessment.....	42
Architecture.....	42
Data Quality.....	42
Performance.....	42
Security.....	47
Tool/Technology capability usage (e.g. materialized views)	48
Summary of Recommendations	49
Approach	50
Quick Hits	50
BI Roadmap.....	53
Maturing the Organization	54
Next Steps.....	59
Appendices.....	60
Identified Business Processes.....	60
Implementation Alternatives Analysis.....	62
Cognos vs OBIEE.....	62

	3
Custom Data Warehouse vs EPM vs ORW	64
Oracle vs Netezza	65
Descriptions of Recommended Tools.....	65
Existing Reports by Subject Area from Interviews.....	65
PeopleSoft EPM Subject Area Analysis.....	69
Existing ORW Tables	70
Current Environment Summary.....	73
Platforms	73
Storage	73
Software.....	85
Conceptual Architecture	86
Data Flow and Interfaces	86
Security.....	89
Assessment Process.....	91
Interview Guide (sent to interviewees prior to interviewing).....	91
Interview Participants – Information removed.....	94

Document Revision History

Revision Number	Date	Revisions
0		MHR – Initial Authoring
1		MHR – Rearranged document to reflect the presentation structure more closely
2		MHR - Enhanced technology comparison section
3	6/11/2008	Reread and fixed a couple of errors

Executive Summary

The OAKS EPM/Data Warehouse implementation, technology and organization were assessed in order to understand the current environment and to identify the root causes of user dissatisfaction and a low adoption rate. Based on that assessment, a BI roadmap and suggested next actions were created to provide a future direction for the OAKS EPM organization. A summary of the results includes:

- User Dissatisfaction
 - Users are not able to get the data they need
 - Users do not trust the data they can get
 - Users do not feel the EPM organization has been responsive
 - Users are spending a lot of time and money working around the problems, in some cases implementing alternative data solutions
- Implementation
 - The current implementation was not a really a PeopleSoft EPM implementation, lacking a key component, the Multidimensional Warehouse (MDW)
 - The current implementation was not based on users' requirements
 - The current database design poses a significant barrier to on-going development
 - The lack of controls and balance points makes it impossible for users to verify the data
 - Job aids like the data dictionaries are not adequate to allow users to find the data they need
- Technology
 - Given the current state and need for rapid results, the PeopleSoft EPM framework is the right place to start
 - The end user query and reporting tool, Cognos, is not the root cause of the performance and usability problems
 - The EPM team is not making effective use of the available tools, particularly with respect to monitoring the environment
 - The EPM team requires additional tool support for key activities:
 - Managing business requirements
 - Data modeling
 - Data quality analysis
 - Version control
- Organization
 - The current self service approach with only limited support for users and no centralized development will not meet the needs of the agencies now or in the future
 - The organization is understaffed
 - Reporting teams are scattered across EPM, FIN and HCM groups making development inefficient with a separation of data and reporting knowledge.
 - Reporting and data expertise are separated, making problem resolution inefficient and development difficult
 - The organization is lacking key roles including:
 - Data Architect
 - Release Manager

- Cognos Master Developer
- Data Quality Analyst
- There is no executive level data governance
- Key processes like Incident Management, Problem Management and Change Control are not adequately defined, documented and monitored
- Quality assurance processes for code and data are not sufficiently well defined or executed

The assessment team recommends that a three pronged approach be undertaken to:

- Restore user confidence
- Implement the BI roadmap
- Renew the organization

Restoring the users' confidence requires making tangible improvements in the existing environment, in particular, making the data available on time, improving performance, simplifying the user experience and removing some long standing annoyances such as the inability to combine financial and human resource data.

Implementing the BI roadmap will involve changing to a requirements focused iterative development approach that can quickly deliver solutions that are solidly founded on users' needs. The route to achieving this is to use the PeopleSoft EPM MDW as the basis for customized subject area data marts. The most pressing business needs are Cash Management reporting and reconciliation. Satisfying these needs will resolve a lot of current dissatisfaction. The BI roadmap will enable many different levels of usage, from canned reports to complex dashboards to ad hoc query with:

- Easy to use and fully descriptive metadata
- Centrally developed and maintained shared reports and applications
- Data models that users can understand and use

Maturing the organization is an ongoing process that must begin with process documentation, staffing, training and realigning key resources to create a Business Intelligence Center of Excellence. The ultimate objective is to increase the BI delivery capabilities of the EPM organization and ensure that users can be effectively supported.

For the OAKS EPM environment to deliver the operational and management reporting capabilities that the State needs, progress needs to be made on all three fronts. The recommended approach is to address each challenge in a separate stream of work.

- Restore the users' confidence.
A series of two to four week "quick hits" that will address (as much as possible) key issues in the current environment.
- Implement the BI roadmap.
Execute a series of 12 week development cycles, each focusing on subject area and satisfying key business requirements as defined by the organization.
- Mature the organization.
Create a Business Intelligence Center of Excellence, adequately staff the EPM organization and begin to formally improve the key support and development processes.

Introduction

Purpose

To perform a complete assessment of the entire OAKS EPM/Data Warehouse in order to identify opportunities and recommend solutions on how the OAKS can better address the business drivers and support the reporting needs of the State.

Scope

Includes the people, process and technology that touch the EPM/DW environment.

Other key aspects of the EPM/DW Assessment scope include:

- Business needs
- Source systems
- Downstream applications
- Security as it relates to reporting tools
- Technology Infrastructure
- Development, maintenance and usage processes
- Organizational readiness

Key Drivers

- Users have been slow to adopt the current EPM implementation
- There has been dissatisfaction with the tools associated with analysis and reporting
- The analytic capabilities of the environment have not been fully utilized or realized
- Many state agencies lost standard reporting (in the conversion to PeopleSoft) that was not replaced by the EPM implementation
- Agencies that have tried to utilize the EPM environment for reporting are frustrated by data quality issues and interface complexity

Objectives

- Identify business priorities and BI requirements
- Determine the degree to which the current environment satisfies the BI needs
- Determine the organizations readiness to support a best practices BI environment
- Offer solutions to better leverage/enhance/replace the existing EPM implementation to meet the BI needs of the State

Context

The following is quoted from OAKS project documents:

The State of Ohio processes approximately 1.5 million payments per year, manages deposits of over \$50 billion annually and pays approximately 64,000 employees every two weeks. With OAKS, the State of Ohio has implemented the most comprehensive Enterprise Resource Planning System (ERP) of any state.

Transforming the Way Ohio Does Business

The Ohio Administrative Knowledge System (OAKS), is a project in which Ohio's State government is viewed as an enterprise, replacing numerous decaying and fragmented systems around the State with one integrated computer system for performing some of the State's primary administrative tasks.

In 2002 the Ohio Department of Administrative Services (DAS), Auditor of State (AOS), Office of Budget and Management (OBM), Office of Information Technology (OIT), and Treasurer of State (TOS) assessed the State's existing central administrative computer systems and determined that an Enterprise

Resource Planning (ERP) system would be a better tool for performing the State's critical central business functions.

Scope OAKS is in the process of integrating the following major Statewide business functions: capital improvements, financials, fixed assets, human resources and procurement. OAKS has replaced the Central Accounting System, and the human resources system (HR2K). Assets Management System

(FAMS) was implemented in July 2008.

Participants

Every State agency and every employee of the State is involved in OAKS in some way. All State employees are involved as well, some in executing the project deliverables and others are simply called upon to adapt and provide feedback on the OAKS self-service systems. OAKS does not only affect the State's agencies but also includes the legislative and judicial branches of government.

More than 500

individuals from 83 State agencies, boards, commissions, universities and other organizations participated in defining the nearly 2,100 business requirements, and counting, that go into building OAKS.

When OAKS is fully functional, State agencies, State employees, vendors and citizens will be able to benefit from its advanced technology, such as "self-service" applications on the World Wide Web.

Management Reporting: One of Ohio's biggest current challenges is to both access and analyze accurate data for use in managerial decision making and strategic planning. ... Stated simply, the requirements provide for a system that allows management reporting for any combination of standard data elements tracked within the system.

The implementation schedule was:

FIN Release 6 - July 2008

Asset Management, Budget and Planning

FIN Release 6 - June 23, 2008

Payroll Modeling

HCM Release 4.1 - May 18, 2008

Time and Labor

HCM Release 4 - February 4, 2008

eBenefits

HCM Release 4 - January 28, 2008

Time and Labor Pilot (DAS)

FIN Release 5 - January 14, 2008

Billing

HCM Release 4 - December 2007

Year-End Processing

FIN Release 3 - July 1, 2007

Purchasing, General Ledger, Accounts Receivable, Accounts Payable, eProcurement, EPM for FIN modules, Expense, and the CAS Data Warehouse

HCM Release 2 - March 27, 2007

Benefits Administration, COBRA, eBenefits (open enrollment only), EPM for Benefits Administration and COBRA

HCM Release 1 - December 18, 2006

Core HR, Payroll, Base Benefits, Time and Labor, ePay, Enterprise Performance Management (EPM) for HCM modules, HR2K Data Warehouse

Org Chart***OAKS Steering Committee***

Names removed

Assessment Approach

The Data Warehouse assessment process consists of looking at the implementation, technology and organization from several different perspectives. The first perspective is that of the stakeholders. Interviewing a broad selection of stakeholders and asking them questions about:

- Current issues
- Past issues
- Perception of the BI organization
- Perception of the BI technology components
- Requirements that are and are not being met
- Business needs that BI could be used to address in the future

The letter sent to participants prior to their interview is included in the appendix.

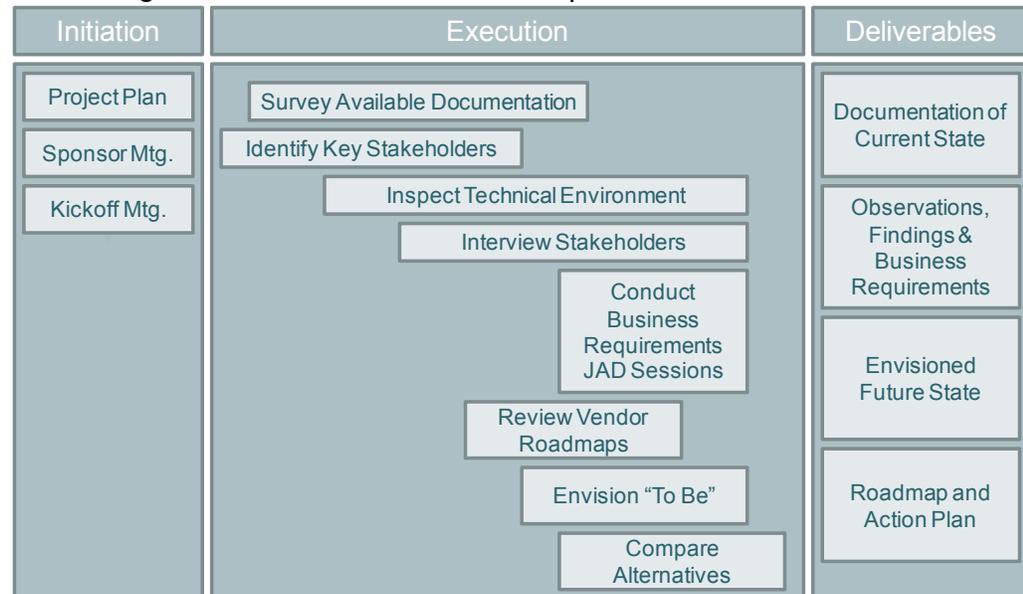
The second perspective is that of BI Capability Maturity Model. This is a model loosely based on the CMM (Capability Maturity Model) developed for software development. It covers eighteen topics in six areas of assessment:

- Business Integration
- Data Architecture
- Technical Architecture
- Support Processes
- Development
- Organization

Taken together, the maturity of an organization along these dimensions defines its' ability to rapidly implement highly effective business intelligence solutions.

The third perspective is derived from hands on investigation of the environment. Among the things that might be investigated are security, report implementation, performance, data quality and usability.

Below is a generic overview of the assessment process.



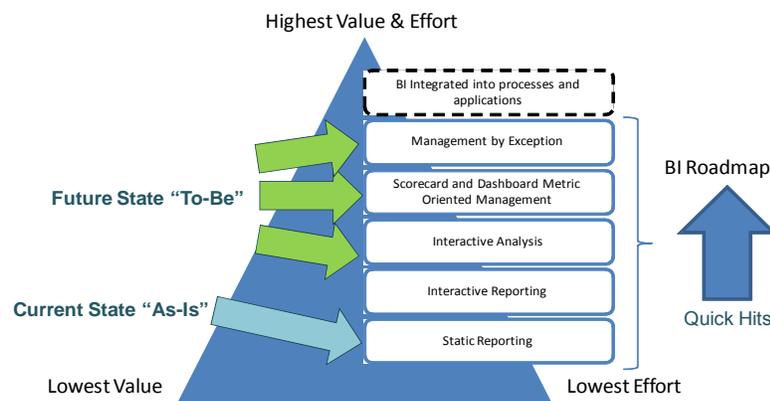
The deliverables for this assessment are:

Deliverable	Comment	Status
AS IS Technical Architecture Diagram	Current_State_Technical_Architecture.doc	Done
AS IS Data Flow Diagram	Current_State_Data_Flow.docx	Done
AS IS Business Intelligence Models	Current_State_BI_Model.docx	Done
Business Intelligence Requirements	BI_Requirements.docx	Done
Current State Technical Risks and Challenges	Current_State_Gaps_Risks_and_Challenges.docx	Done
Organization and Resource Readiness Documents	Organization_and_Resource_Readiness.docx	Done
Presentation and action plan	Executive_Presentation_Final.pptx Interviewee_Presentation_Final.pptx Technical_Presentation_Final.pptx	Done
Recommendation and Findings		Upd.
Project plan for Next Steps	Project_Plan_For_Next_Steps.pptx	Done
To be Technical Architecture	Future_State_Technical_Architecture.docx	Done
To be Data flow Diagram	Future_State_Data_Flow.docx	Done
To be Business Intelligence Models	Future_State_BI_Model.docx	Done

OAKS EPM Mission Statement

Based on the interviews conducted, the assessment team came up with a proposed mission statement for the OAKS Enterprise Performance Management (EPM) team. This may be used as a set of guiding principles and ultimately as a way of determining success.

- **Provide a central store of cross departmental financial, employee and budget information that is:**
 - Easily accessible
 - Complete and consistent with respect to the information available from PeopleSoft
 - Usable for a wide variety of reporting needs
 - Reconcilable
- **Provide common tools for reporting that are:**
 - Usable by occasional users with minimal training for fixed reports
 - Usable by non-specialist developers and power users to meet more complex reporting requirements
 - Usable by specialist developers (within OAKS or within agencies) to develop sophisticated applications including dashboards
- **Provide a support structure that enables:**
 - Agencies to carry out their own day to day reporting
 - Agencies to develop their own more customized reports based on the provided reports, available data and tools (data dictionaries, report inventories etc.)
 - Agencies to develop sophisticated applications with a minimum of assistance from OAKS staff



The ultimate challenge is to deliver effective solutions that deliver more value than the entirely report based approach that existed before through dynamic reporting, dashboards, and alerts. Static reporting is still and most likely will always be a key part of the functionality that OAKS provides, but there is a lot of potential to dramatically reduce the time spent resolving issues, analyzing data and performing auditing functions through enhanced BI capabilities beyond reports.

In terms of value to the organization, providing a single dashboard can sometimes generate many times the leverage of a stack of reports. Giving people the ability to manage by exception, wherein issues are brought to their attention can not only generate further leverage, but also reduce the risk that problems may go unnoticed. The biggest reward for

investing in Business Intelligence capability comes when the information products it provides become deeply integrated into the processes of the business.

The challenge to the OAKS EPM team and to the state agencies is to go beyond their immediate needs and envision a world in which information derived from OAKS enables them manage their finances and personnel in new ways.

Findings

Overview

Our assessment followed the methodology outlined in the “Assessment Approach” section above. Some areas of investigation were hampered by a lack of available information. In particular, our assessment team was unable to explore performance in detail because:

- Batch job schedule and history information could not be provided in a usable format [*some of this information became available after the conclusion of the on-site portion of the assessment and has been incorporated into this document*]
- Server level performance history data was not provided for the database and Cognos servers
- The current design of the ORW and poor report design prohibit an accurate capacity and performance assessment of the environment as a whole

The following is a summary (at a very high level) of the findings:

- Users were found to be almost uniformly dissatisfied with the current OAKS EPM offering.
 - Users are not able to get the data they need
 - Users do not trust the data they can get
 - Users do not feel the EPM organization has been responsive
 - Users are spending a lot of time and money working around the problems, in some cases implementing alternative data solutions
- The current OAKS EPM environment was found to have significant design and implementation issues.
 - The current implementation was not a really a PeopleSoft EPM implementation, lacking a key component, the Multidimensional Warehouse (MDW)
 - The current implementation was not based on users’ requirements
 - The current database design poses a significant barrier to on-going development
 - The lack of controls and balance points makes it impossible for users to verify the data
 - Job aids like the data dictionaries are not adequate to allow users to find the data they need
- The OAKS EPM technology choices and implementation were generally found to either meet their needs or have the potential to do so.
 - Given the current state and need for rapid results, the PeopleSoft EPM framework is the right place to start
 - The end user query and reporting tool, Cognos, is not the root cause of the performance and usability problems
 - The EPM team is not making effective use of the available tools, particularly with respect to monitoring the environment
 - The EPM team requires additional tool support for key activities:
 - Managing business requirements
 - Data modeling

- Data quality analysis
 - Version control
- The complete self service approach and the current organizational support are not adequate to enable effective deployment of EPM.
 - The current self service approach with only limited support for users and no centralized development will not meet the needs of the agencies now or in the future
 - The organization is understaffed
 - Reporting teams are scattered across EPM, FIN and HCM groups making development inefficient with a separation of data and reporting knowledge.
 - Reporting and data expertise are separated, making problem resolution inefficient and development difficult
 - The organization is lacking key roles including:
 - Data Architect
 - Release Manager
 - Cognos Master Developer
 - Data Quality Analyst
 - There is no executive level data governance
 - Key processes like Incident Management, Problem Management and Change Control are not adequately defined, documented and monitored
 - Quality assurance processes for code and data are not sufficiently well defined or executed

Interview Results

In general, interview results were very consistent. Our practice in these interviews was that in general, we would not single out the responses of individuals in our findings in exchange for more candid responses. This turned out to be an effective strategy, though one that may be frustrating to the EPM team's current request-response model of support. The business needs identified and problems surfaced should be considered as conversation starters with the users, not as complete and sufficient requirements or problem definitions.

Concerns

The following matrix shows the distribution of concerns across the agencies interviewed. Cells marked with red indicate that the agency was concerned about a particular kind of issue like data quality or a particular business requirement not being met, such as reporting on cash or encumbrances. One very specific issue came up often enough and with sufficient vehemence that it is included despite being very specific was "Alpha Columns". This issue refers to the fact that having tables with 900 columns without even being alphabetized when listed in Cognos makes the tool essentially unusable in that context. It should be noted that the same issue applies to tables with even a few hundred columns.

Agency	Overall	AGE	AGO	AUD	BTA	BWC	COM	Culture	DAS	DEV	DMH	DNR	DOH	DPS	DRC	DVS	DYS	EPA	INS	JFS	LRS	MRDD	NUR	OAC	OAKS	OBM	OCC	ODE	OIT	PWC	RSC	SFC	TAX
people	90	1	3	2	2	1	1	1	3	1	2	3	3	1	1	1	4	3	1	4	2	2	1	3	13	1	2	5	1	1	1	1	
Cash on hand																																	
Data Quality																																	
Performance																																	
Usability																																	
Functionality																																	
Support																																	
Reconciliation																																	
Availability																																	
Alpha Columns																																	
People Tracking																																	
Encumbrances																																	
Using alternative reporting methods																																	

Some quotes from interviews:

“With CAS we spent 2 hours to compile the information for one report. With Cognos it takes 3 people 12 hours each.” (Performance)

“It takes as long as 40 minutes to get to a prompt screen and then another 20 minutes to actually run a report and I have to tape down the control key to get the result.” (Performance)

“Right now I am a data checker and a button pusher; I would like to work on the job I was hired for.” (Data quality)

“We had 500 transactions missing in November, seemed to fall off the queue, we are still working on trying to resolve it.” (as of 9/26/2008) (Data quality)

“...need to know what is happening with cash, right now, yesterday and year to date. We want to report on a cash basis by program, acct id, grant, reporting ID. We have around 50 federal grants we report on. Right now the treasury will deposit cash but we cannot access that detail.” (Functionality)

Below is a slightly more detailed version of the concerns matrix. Yellow cells indicate an issue which was mentioned only once in the interview, while the red cells indicate that the issue came up repeatedly. This is useful to know because it helps understand the pain level associated with certain issues and for organizations which provided multiple groups to interview, whether the concerns are universal.

Note: When reviewing interview notes, it is apparent that agencies and even individual interviewees are somewhat inconsistent in the answers they give. One person from DAS specifically indicated that performance was OK (green) and also that slow running reports were an issue. The grid below represents the answers to direct questions, not necessarily what we might infer from the other answers given by the interviewee.

Agency	Overall	OBM	SFC	JFS	OAC	DAS	LRS	OAKS	Culture	OBM	OBM	BTA	RSC	MH	JFS	OAKS	AGO	BWC	JFS	ODH	EPA	MH	AGO	BTA	Nursing	DAS	EPA	JFS	IOIT	HCN	OAKS	LRS	OBM	OBM	OAKS	OBM	OBM	DNR	AGO	DNK	IMHODH	DEV	OCC	OBM	OBM	DYS				
Data Quality																																																		
Availability																																																		
Performance																																																		
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Cash on hand																																																		
Encumbrances																																																		
Using alternative reporting methods																																																		

Legend

	No problem, works as expected
	One concern mentioned
	Multiple concerns on this topic
	No information on this topic from this interview

Some of the things that are worth noting are:

- OBM, the organization that would be responsible for certifying reports was VERY concerned about data quality
- DAS, with arguably the most access to people who know how to write reports was less concerned about performance, reinforcing the notion that well written reports can dramatically improve performance
- Concerns with larger agencies are not uniform, suggesting that business requirements need to be gathered in a broad fashion.
- Availability and performance, while being concerns across the board, did not rate repeated mentions in the interviews. The same was true of:
 - o Alpha Columns
 - o People Tracking
 - o Grants
 - o Encumbrances

An interesting fact that emerged from the interviews was that many users have given up on submitting help desk tickets. This has had the effect of making it appear to OAKS staff that they had a reasonable picture (through helpdesk ticket) of the issues users are experiencing, which is apparently not the case.

Below is a list of concerns extracted from **one** interview as an example. This is from the Department of Administrative Services (DAS).

- No certified daily cash balance by OBM/OAKS
- Performance issues for monthly Cognos reports extending agency resources. Month-end in CAS was started and completed within two business days of calendar month-end . With OAKS, month-end close can't begin until OBM completes posting, which usually is within ten business days of calendar month-end. After OBM is complete, agency month-end takes between two to three days to complete processing.
- YTD payroll reports for the agency exceed Excel (2003) limitations. Reports must be run by month.
- Payroll Recap Report for approximately 800 employees contains somewhere between 25,000-35,000 rows. The issue is with the account code being extended in OAKS to 5 characters versus 3 characters in CAS.
- OAKS / EPM reports being utilized contain inconsistent balances for similar reports.
- Detail Disbursement reports require 30-45 minutes per execution per division.

- *Help desk tickets not always resolved. - E.g. Help desk ticket issue in Nov 07' is still pending. No communication has been received as to the status of the ticket. Issue was regarding missing data in some tables yet populated in others for the same column.*
- *Inconsistent and vague data dictionary descriptions. E.g. Agencies needed MBE/EDGE indicator to maintain percentiles vendor commitments for MBE/EDGE (5%) and Minority (15%) entities. Data dictionary description for column 'VoucherUser1' was 'VoucherUser1'. Later it was discovered that 'VoucherUser1' contained the MBE/EDGE flag. The data dictionary was later updated to reflect the clarification.*
- *No Cognos training provided by OAKS. Agency used own funds for Cognos training at computer workshop. Training classes were ineffective because of the generic data that was used.*

It should be noted that the interviewees may or not be completely correct in their perceptions, but the repeated mentions of similar issues is suggestive and most of the issues mentioned by users were verifiable. It is important to understand that perceived issues can in some cases be as damaging as the real issues.

Across almost all of the interviews with users and consumers of data, there was a consistent message that users were spending their time writing reports and running reports rather than actually doing the jobs that they were hired to do. From the interview data it is not possible to estimate the cost of this with any certainty, but it is certainly at least several FTEs (full time equivalent people).

There was also a consistent message from larger agencies that they had already or were in the process of developing alternatives to relying solely on the data provided in the Operational Reporting Warehouse (ORW). They gave several reasons for this. One reason was that they needed to combine OAKS data with their own agency data. Another was that they had run into issues with the OAKS environment that were not resolved in terms of performance or data quality.

A slightly less consistent, though common message was that users felt disappointed that their expectations had not been met. Most of the people we interviewed from agencies are in positions where they need report information to do their jobs (payroll officers, administrators, etc.). The loss of their normal reports from CAS, HR2K made it significantly more difficult for them to do their jobs. The further requirement to learn a reporting tool as well as a newly arranged set of data was an unwelcome burden. Some of those most acutely disappointed had originally looked forward to the new reporting environment because of problems with the CAS and HR2K systems.

The challenges of the new reporting environment seem to have resulted in two distinctly different responses within the user community:

- "I wasn't hired to be a report writer and I can't learn Cognos or understand how to get my reports."
- "I wasn't hired to be a report writer but I'll learn."

These individuals have generally tried one or more of following remedies:

- They attended the training – most felt they still didn't understand the tool. This was in part due to the generic nature of the training on data they were not familiar with.

- They requested and attended labs. These labs had people that in most cases did not understand the data and didn't know where to find it, but were otherwise considered useful.
- They tried to follow the instructions and still could not get the reports they needed.
- They have formed groups to try training on their own and from others who were also in the same position, with some success but not enough to solve most of their problems.
- They found funds to pay for outside consultants to create the reports they needed.
- They found funds to pay for outside consultants to create yet another reporting system for their agency.
- They have changed the nature of their work so that they are spending less time (in some instances less than half their time) on their job (what they were hired for) and more time on learning how to create reports.

Nearly all of the individuals we talked to still feel their reporting requirements are not being met.

From the interviews, we compiled a specific list of issues and gaps. Some of these have already been opened as CRM issues, some apparently have not. Not all of these issues are specifically dealt with in detail in our recommendations. It should also be noted that some of the items desired may not be possible or even desirable from an enterprise point of view.

Categories	Status Prior to July 1, 2007	Desired State	Gaps
Reporting			
Grants	Could report on grants by spending authority	Report on grants by spending authority detailing open encumbrances	Open encumbrances information available from financials but doesn't exist with EPM warehouse
Cash Balances	Cash basis accounting	Cash basis accounting	Peoplesoft accrual basis affects daily reporting. Not as much affect on monthly reporting.
Voucher Data	Voucher data in sync with payroll	Voucher data in sync with payroll	Voucher data not in sync with payroll
Voucher Information	Voucher access by Department ID	Voucher access by Department ID	Voucher access is by Business Unit
Effective dating	Transactions not posted after close	Transactions not posted after close	Peoplesoft provides process to post transaction after close creating floating journal issues
Payroll	Run reports that merge earnings, taxes and deductions	Run reports that merge earnings, taxes and deductions	Payroll Objects table in EPM not returning results due to system time out parameters
Employee Position	Run reports that detail employee position	Run reports that detail employee position	Position control table in EPM has multiple entries per employee position. Which is the desired row?
Employee Position	Job code and position descriptions with consistent naming conventions	Job code and position descriptions with consistent naming conventions	Job code and position descriptions have multiple results (partial descriptions and full descriptions, some lower case and some upper case)
Auditing	Were able to track user updates by Employee ID and update date	Ability to track user updates by Employee ID and update date	Unable to track employee updates
Employee Earnings	Ability to run reports to detail employee earnings	Ability to run reports to detail employee earnings	Employee earnings in EPM are stored inconsistently. Report logic needs to review all 20 field occurrences looking for appropriate earning code.
Employee Earnings	Ability to run reports to detail employee earnings for leave, etc	Ability to run reports to detail employee earnings for leave, etc	Earning codes aren't broken down by type. For example, CPE earning code is applicable to CT Court Leave, CT Emerging Hrs, CT Holiday Hrs and CT Eamed
Voucher Reporting by PO	Ability to see all transaction that post against agency	Ability to see all transaction that post against agency	Transaction posting with different business unit thus preventing access due to row-level security
Accounts Receivable	Ability to report on accounts receivable revenue summary	Ability to report on accounts receivable revenue summary	Chartfields (Dept ID,etc) not being populated in the EPM table when revenue reference a Pending Item
GL Lifetime Revenue and Expenditures	Ability to report on expenditures against prior FY encumbrances	Ability to report on expenditures against prior FY encumbrances	EPM table doesn't contain budget data thus forcing the user to use the Journal Transactions (much slower)
Detail Journal Data	Ability to report on voucher id and item id	Ability to report on voucher id and item id	Voucher ID and Item ID aren't available on the Journal Transaction table. Required to access the corresponding subsystem (HCM, FIN) to retrieve this data.

Categories	Status Prior to July 1, 2007	Desired State	Gaps
Reporting Management			
Admin. Framework	Administrator to set up folders and manage access rights within folders	DMH Administrator to set up folders and manage access rights within folders	OAKS will provide folder creation but limited security.
Ad Hoc Reporting	Ability to build custom formulas & custom filters that could be shared across reports.	Ability to build custom formulas & custom filters that could be shared across reports.	OAKS will not provide access to the COGNOS framework to create custom formulas/filters.
Reporting Lifecycle	Test and Production environment	Test and Production environment	OAKS will allow folder creation but not separate security.
Report Snapshot	Snapshots produced based on schedule, users are restricted based on security.	Snapshots produced based on schedule, users are restricted based on security.	Since snapshots cannot be stored, a DMH employee would have to manually store/post them somewhere else so that users would have access.
Custom SQL	Ability to write Database level SQL	Ability to write Database level SQL	OAKS will not provide.
Linking Capability	Ability to link data within various data sources and within CAS extracts.	Ability to link data within various data sources and within OAKS data structure.	Only link within OAKS tables

Categories	Status Prior to July 1, 2007	Desired State	Gaps
User/Data Security Administration			
User Profile	Finance, HR and Management Staff. Access to reports only.	Finance, HR and Management Staff. Access to reports only.	OAKS gives access to HCM and FIN if reporting is granted.

Categories	Status Prior to July 1, 2007	Desired State	Gaps
Resources/Data Management			
Categories	Status Prior to July 1, 2007	Desired State	Gaps
Data Access	Available 24 hours/7 days a week	Want access 24/7 but minimum access between 6am - 7pm 7 days a week.	Data is not available before 9 am. This has a negative impact on data users and developers.
Retention Period	Rolling 3 fiscal years	Rolling 10 fiscal years	
Performance	All reports display within 10-20 seconds	All reports display within 10-20 seconds	Performance continues to be very poor. This has a negative impact on both report development and on data users.
Frequency	Data updated nightly	Data updated nightly	Appears to be a low priority by OAKS to have current data in warehouse. If batch problems occur, missing data is not loaded until the next processing day and combined with the following day's data.
User Resources	Help page and recent updates section to track changes in the ARD.	Bulletin page for new reports/changes as well as help page.	DMH will have to re-create a user help page on our intranet (maybe a Bulletin page for new reports and/or changes).
Data Integrity	Audit reports to ensure data is loaded	Audit reports to ensure data is loaded	There is no report detailing which tables were or were not updated
Data Sources	DAS Payroll, CAS, Auditor of State (warrant info), Workers Comp, Cas Plus Workflow, PCS.	OAKS HCM and Finance	Unable to connect to Agency maintained databases.
Data Load Process	DMH receives 40 extracts and loads them into DB2	OAKS loads/maintains the database, MH has access to the DB from their <u>own</u> environment.	
Reporting Site	Users access one location for all data needs.	Users access one location for all data needs including Agency specific data (i.e. PCS, BWC).	Currently 2 areas (CAS Legacy Warehouse, OAKS data). Information is not in one location (i.e. agency data cannot be linked).
Viewing Attachments	Users can view travel receipts in ARD.	Users should be able to view travel receipts or other attachments in ARD.	No attachments are available in the data warehouse. Therefore, no analysis can be performed on travel.
Travel Details	Users can view travel details and prepare analysis on travel patterns.	Users should be able to view travel details and prepare analysis on travel patterns.	Only vouchers generated from travel expense reports are available for analysis (no travel details).
Data Definitions	Developers are familiar with the data and have created detailed development documents.	A complete data dictionary is available on line with detailed usage examples and references to reports that use each table. OAKS would provide a functional expert for data questions.	Data dictionary exists but has a lot of generic descriptions and very few data examples. There does not appear to be a method in place to train new report developers on the data.
Cross-walk	Not applicable, people knew accounts.	Accurate cross-walks	User expressed there were errors in the crosswalks.
Precision	Unknown	Currency, i.e. 2 decimals places.	Some reports have a precision of 6 decimals places.

Data Quality

Across the board, users indicated that they felt they could not trust the results they received from the ORW. Some users have instead begun running reports against the operational systems. The key data quality concerns are:

- The users are unable to tie the numbers reported from the ORW back to the source systems
- There appear to be different values for the same data elements depending on where in the system the value is observed
- Reported values sometimes change between successive runs of the same report
- Different reports give different results when they should be giving the same results
- There is data in the ORW which was entered incorrectly at the source system
- There are near duplicate rows in the ORW for which there is no apparent good reason
- There are no run-to-run controls or balance points throughout the system to ensure that the data arriving in the ORW is substantially what is in the source systems

Inspection verified that there are data quality issues although the root causes are sometimes more a result of a discrepancy between what users expect and the actual data model and business rules implemented. Examples of this include:

- Multiple rows with effective dates
- Near duplicate rows
- Transactions entered directly into a journal

Some examples of data quality issues reported by users:

1. “Cash on hand does not match when you look in the OAKS report OHGLR052 compared to looking in commitment control.” The user provided an example for fund 4250 in which the numbers appear to have no relation to each other (i.e. it does not appear to be possible to reconcile them). This suggests that either the report is incorrect (not looking at the same data elements, joining improperly etc.) or the data was bad (possibly not fully loaded).
2. One user indicated that there were duplicate employee records in the Employee Master table. Subsequent investigation confirmed this. Some records differed in only a single field and that field was not a natural key. This will produce wrong results on some reports.

Nearly every interviewed user asked for a core set of “certified” reports to use for reconciliation and verification. When interviewing OBM management, we brought up the issue and they identified run-to-run controls and internal balancing reports as a pre-requisite to “entering into a discussion” about certifying reports.

Because of the approach taken to implementing HCM, little validation is done in the application. The ETL processes used to populate the warehouse also do not perform validation, meaning that the only check on data quality is when an end user sees anomalies in their reports. An example of this was when data concerning ethnicity was not correctly entered.

Issue	Impact	Recommendation
Users do not have “certified” reports	Users are unable to rely on the reports they are using	Provide the balancing reports and run-to-run controls that the OBM needs to be able to certify reports
Users are able to enter data incorrectly in the source	Reports are incorrect. This can have serious impacts,	Begin doing root cause analysis on data issues and

systems	particularly for compliance reporting.	fixing the issue at the source system where practical. Where not practical, variance reports and edits should be developed to catch the issue as the data is loaded to the warehouse and make users aware.
Users do not know which numbers in the system should match	Users cannot reconcile	Provide reports and guidelines that users can use to reconcile and verify their reports.
Reports do not agree	Users may make incorrect decisions based on incorrect reports	Provide certified reports for basic needs, simplify the model to reduce the number of issues with effective dates and near duplicate rows and make it clearer what fields should be used for what purposes.
Corrections are violating data integrity	May cause audit issues	When a data discrepancy is identified, the remediation for it should be recorded and if it is likely to recur captured as a procedure. Reports may need to be developed to catch instances where the fix was not correctly applied.

Performance

Nearly every user identified report performance as a concern. One user reported having a second PC at her desk in order to run reports. Users also identified report prompts and column lists in Cognos as performance issues. Performance issues in the batch schedule are also visible to end users (discussed further in the Availability section).

Root cause analysis on slow report performance, slow report prompts and slow column list problems indicate that Cognos as a BI tool is not the problem in any of these cases. All three are attributable to:

- The ORW database design
- Poorly designed reports (also often a side effect of the database design)
- The fact that some tables have more than 900 columns (also a result of the database design)

During the period of our assessment, OAKS staff tuned several reports and queries (some in response to users' requests, some identified during our assessment process. In each case, they achieved more than 10 x improvements in report performance from the user's perspective. The issues addressed included:

- Prompt queries that were essentially running the report query repeatedly with a “DISTINCT” function.
- Joins set up in the Framework were incorrect, forcing joins on non-key fields.
- Queries were returning more columns than were really necessary.
- The reports were returning more rows than was really required to answer the question (insufficient selectivity).

Issue	Impact	Recommendation
The Cognos tool has issues dealing with the wide tables currently implemented	Users are unable to effectively specify reports	Take steps to narrow the view of the tables, through the database or through the Cognos model
Prompts are slow in Cognos	Users wait excessively to start up a report	Tune the queries being used to generate prompts, materializing dimensions or codes tables if needed.
Most reports are slow running	Users are unhappy with the environment	Tune reports, tune the tables, verify the joins and redesign the database to make it easier to design decent performing reports.

Usability

Users and developers both indicated that writing correct reports was difficult. Users indicated that it was difficult to find data and it was almost impossible to verify the identity of data elements (in a business sense). Inspection of the data dictionaries identified several issues that would support these observations by users. A concrete example of this that we observed was the MBE/EDGE flag. For several months users asked for the data and were told that it should already be there, but no one was able to tell them what field it was actually being populated to. It was finally identified as “User Field 1” by inspecting the data for known examples and correlating the data. It should be noted that while sometimes successful, this process is error prone because it does not necessarily expose the business rules involved in populating the field. In this particular example, it turns out that that a single field is being overloaded for the MBE and EDGE flags. This is not, however representative of the business reality because a business can be neither or both in addition to being one or the other.

Cognos was frequently identified as a usability issue, but when questioned further all users interviewed indicated that the real issues were in understanding the data models, performance and in mismatches between the data model and the way the Cognos tool is being used. A good example of this is that there are several tables with hundreds (900+ in one case) of columns. Trying to select from these in a list box is simply not practical. This is aggravated by the fact that they are not sorted when they are displayed. There are things that could be done at the Cognos Framework level to make this work better, but the real issue is the enormously wide tables and the expectation that users will simply write reports directly against them.

The users indicated that the data dictionaries were useful, but pointed out examples from them in which the definitions were either incorrect or simply not useful. They also indicated that there was a deeper issue of being unable to relate the business term to the

PeopleSoft name for the field and the data dictionaries frequently did not address this adequately.

Users also identified training as a usability issue. In particular they observed that training was too far in advance of usage and did not use the State's data.

Issue	Impact	Recommendation
Users have difficulty finding data	It takes longer than it should to write reports and some reports are built incorrectly	Data dictionaries must be simplified and definitions must be cast in business terms.
Users have issues using Cognos with the models provided	Users see Cognos (incorrectly) as the problem and stop trying to use it	Provide models at both the database and framework level that reflect the users business needs
Users do not feel that training was adequate	Users are frustrated	Provide timely training to users customized with the data examples they will actually be seeing

Functionality

In general users were satisfied with the functionality of the tools (this is not surprising given the preponderance of basic static reports). Users were often confused though about whether they should be using Cognos, SQR or PSQuery in order to get their data.

- Agencies had significant issues with the change from cash to accrual accounting and its impact on Cash Management.
- That the numbers reported for available cash from different parts of the system are not the same
- Agencies want to have at least a few “certified” reports as they have concerns about the accuracy of the information they are getting. These data quality issues appear to have many different root causes:
- Long running ETL jobs cause some data to be “missing” in some reports depending on when they are run
- The “soft” monthly close which causes numbers to change after the official end of the month
- Data entry issues in the source systems for which there is not validation either in the source or in the ETL processes
- A disconnect about the true meaning of the field
- Lack of clear lineage for elements in the warehouse, making them uncertain where the number is really coming from
- Lack of clear business rules for what is and is not being included in each table
- Lack of understanding about what numbers they should be able to reconcile
- Limited access to people who really understand the data in the EPM tables
- A core set of reports that all agencies could use and modify (Basic Agency Reporting)
- The ability to move easily from aggregate to detail data (drilling)
- The ability to track people as they move from department to department (currently security precludes this)

- The ability to tie HCM and FIN data together

Because users were so focused on the reports they did not have yet, it was difficult to determine if there were other functional requirements.

Support

Our interviews revealed a mixed response with respect to support. Almost all users expressed dissatisfaction with:

- Inadequate, untimely (too long before it was available) and generic Cognos training
- Lack of good report samples to use as a basis for developing new reports
- Difficult to use and/or unreliable job aids like the current data dictionaries
- Having to deal with both OIT and OAKS for some Cognos related issues
- Having their requests “get lost” in the process
- Having no insight into the incident management process
- Not having access to people well versed in the data they are trying to query

The interviewed individuals differed significantly though in how much impact this had on their work. The “Lab” concept in which a user sets up an appointment with a Cognos developer and works with the developer on a specific issue was generally thought to be a good idea. It is apparently marred though by a lack of knowledge about the OAKS data on the part of the Cognos developers.

An often echoed comment was that the users “knew more about the data” than the developers who were supposed to be able to help them.

Many of the interviewees did not really distinguish between their frustration about reporting in general and their particular issues with the support processes.

A number of people interviewed expressed enthusiasm about the prospect of eventually having an environment where they would be able to run their own reports.

Issue	Impact	Recommendation
Lack of good report samples to use as a basis for developing new reports	Users do not have a good starting point for developing reports.	OAKS EPM should provide a core of shared functionality and good models that can be used to develop further reports
Difficult to use and/or unreliable job aids like the current data dictionaries	Users are dissatisfied and blame the tools	Provide more user friendly training, documentation and data dictionaries
Issues “get lost”	Users lose faith in the organization	Establish, document and follow incident management processes that ensure that issues are not closed prematurely and that there is transparency into the process
Users are unable to get help from people familiar with both Cognos and their data	Issues are not resolved correctly in a timely fashion	Report writing groups associated with OAKS should be consolidated and

SMEs should be part of the support team.

Problems often recur	User frustration increases greatly and support resources are wasted	The EPM team needs to make root cause analysis a regular part of incident management and problem management processes
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Availability

The primary concern expressed in interviews concerning availability was the fact that the data is frequently not available for reporting in the morning. The fact that this shows up in several different ways including:

- Reports failing (acceptable)
- Reports running but not returning any data (not acceptable)
- Reports running but returning incorrect information (not acceptable)

and occurs sometimes even when a data warehouse “dashboard” provided by OAKS indicates the warehouse is available is especially unsettling. Users indicated that this had a significant impact on their confidence in the warehouse. This shows up as a data quality problem as well as an availability issue.

Not all users were familiar with the dashboard. It should be noted that the requirement to check the dashboard before running reports tends to discourage users from using the scheduling facilities of Cognos.

Report failure and excessive runtimes were also perceived as an availability issue.

Business Requirements

User Community

To facilitate analysis, the assessment team divided the agencies into three groups based on the number of registered Cognos users. This approach worked fairly well and more or less matched an intuitive categorization of the agencies by size. The groupings and some of their characteristics are below:

Large User Base Agencies (9)

10,688 users

Characteristics:
 Only a few agencies
 Thousands of users
 Wide variety of requirements
 Many complex requirements
 Has own IT capability
 Already developing custom reports

Medium User Base Agencies (11)

2,526 users

Characteristics:
 Only a few agencies
 Hundreds of users
 Many common requirements
 Some complex requirements
 May have own IT capability
 Some developing reports

Small User Base Agencies (81)

1,311 users

Characteristics:
 Many agencies
 Only a few users each
 Mostly common requirements
 A few with complex requirements
 Do not generally have IT capability

Many of the larger agencies not only have their own IT capabilities and have written their own Cognos reports for OAKS data, but have also integrated OAKS data feeds into their own reporting environment.

The following charts illustrate business requirements by agency group for broad subject areas. They also indicate which agencies have their own financial reporting environment.

Small Agencies

AGENCY NAME	RESOURCE CAPABILITIES								AGENCY DB USED TO SUPPORT EPM REPORTING
	CASH MGMT	GRANTS	PAYMENTS	PAYROLL	EMPLOYEE	BUDGETS	EXPENSES		
Attorney General(AGO)	N	S	S	S	S	C	S	Oracle	
Board of Nursing(NUR)	N	S	S	S	S	S	S		
Board of Tax Appeals(BTA)	N	S	S	S	S	S	S		
Cultural Facilities Commission(AFC)	N	S	S	S	S	S	S		
Dept of Commerce(COM)	Y	C	S	M	C	M	M	Access	
Legal Rights Service(LRS)	Y	S	S	S	S	S	S		
Office of Consumers' Counsel(OCC)	N	S	S	S	S	S	S	Access	
Ohio Arts Council(ART)	N	S	S	S	S	S	S		

Resource Capabilities Y/N - Does the organization have report development resources
 Requirements Complexity: S - Simple M - Medium C - Complex
 Assessed
 Identified as Somewhat Urgent
 Identified as Very Urgent

For the smaller agencies that were interviewed, the lack of cash basis reporting was the single biggest issue. There appeared to be several related issues though:

1. The familiar CAS cash reports were not available and the agencies lacked the expertise or staff to create their own or determine whether the reports created by other agencies would meet their needs.
2. The change from cash to accrual basis accounting left them unable to get the cash based reports they required for federal reporting and for managing daily expenditures.
3. When they look at cash, they see different numbers from different places in the system and are not able to reconcile those numbers.

Medium Agencies

AGENCY NAME	RESOURCE CAPABILITIES								AGENCY DB USED TO SUPPORT EPM REPORTING
	CAPABILITIES	CASH MGMT	GRANTS	PAYMENTS	PAYROLL	EMPLOYEE	BUDGETS	EXPENSES	
Dept of MRDD(DMR)	Y	M	S	C	M	S	S	M	SQL Server
Dept of Taxation(TAX)	Y	M	S	C	M	M	C	C	Access
Insurance(INS)	Y	M	S	C	C	M	M	C	Y
Dept of Youth Services(DYS)	Y	M	S	C	C	M	M	M	SQL Server
Rehab Services Commission(RSC)	N	S	S	M	C	C	S	M	Y
Dept of Development(DEV)	Y	S	S	C	C	M	C	C	Y
Dept of Education(ODE)	Y	S	M	M	C	M	C	M	Oracle
Office of Budget & Mgmt(OBM)	Y	C	S	C	C	M	C	C	Y
Dept of Aging(AGE)	Y	M	M	C	M	M	M	C	Y
DEPARTMENT OF VETERANS' SERVIC(DVS)	Y	M	M	C	M	M	M	C	SQL Server
Dept of Transportation(DOT)	Declined Interview								

Resource Capabilities Y/N - Does the organization have report development resources
 Requirements Complexity: S - Simple M - Medium C - Complex
 Assessed
 Identified as Somewhat Urgent
 Identified as Very Urgent

For medium agencies, cash basis reporting no longer appears to be the primary requirement. Many of these agencies have already begun constructing alternate means of generating the reports they need. These agencies are more concerned with managing the payment process, payroll and expenses (which is what common sense would suggest).

Large Agencies

AGENCY NAME	RESOURCE CAPABILITIES								AGENCY DB USED TO SUPPORT EPM REPORTING
	CAPABILITIES	CASH MGMT	GRANTS	PAYMENTS	PAYROLL	EMPLOYEE	BUDGETS	EXPENSES	
Job and Family Services(JFS)	Y	M	M	C	M	M	C	C	Oracle
Bur of Workers' Compensation(BWC)	Y	S	M	C	M	C	C	C	Access
Dept of Rehab & Corrections(DRC)	Y	M	S	M	C	C	M	M	Access
Dept of Public Safety(DPS)	N	M	S	C	C	M	C	M	None
Dept of Health(DOH)	Y	S	S	M	M	C	S	C	DB2
Dept of Natural Resources(DNR)	Y	M	M	C	C	M	C	C	SQL Server
Mental Health(DMH)	Y	S	S	C	C	C	M	C	SQL Server
Administrative Services(DAS)	Y	C	S	M	C	C	S	M	None
Environmental Protection Agcy(EPA)	Y	C	C	C	C	C	M	C	Access

Resource Capabilities Y/N - Does the organization have report development resources
 Requirements Complexity: S - Simple M - Medium C - Complex
 Assessed
 Identified as Somewhat Urgent
 Identified as Very Urgent

Large agencies, like the medium agencies are less concerned generally about cash management reporting provided by OAKS and more concerned about payroll, employee and expense management. All of them have written at least some of their own reports against OAKS data and all of them have internally available alternatives. Their primary concerns actually center on data quality.

Business Intelligence Solution Needs

Basic Agency Reporting

Basic agency reporting is a set of reports that can be used by all agencies to fulfill a significant subset of their standard reporting. This list is based on the one provided by the CSA:

- Available Cash Position
- Detailed Transaction Report
- Transaction Status Report (held etc.)

- Budget vs. Actual Report
- Detailed Cash Receipt Report
- Lifetime Grant Activity Report Summary to Detail
- Current Active Grants Report
- Open Encumbrances Report
- Funds Status Report
- Vendor Report
- Open Receivables by Customer
- Open Receivables by Fund
- Travel and Expense Reporting
- Payroll Report
- Payroll Projection Report
- Positions Report
- HR Status Report
- Canary Query Reports

This list is not comprehensive, but it gives a flavor of the kinds of reporting almost all agencies need.

Grants Management

- Each grant essentially needs its own checkbook
- Every two weeks, money is drawn and details of spending are reported
- Should simplify reporting by fiscal year... currently have to track fiscal year through the PO
- Some agencies have complicated intra-agency funds (EPA, Health etc.)
- Need to match CASH to GRANT
- Need to trend and compare periods

Funds Management

- A dashboard that would show funds by period
- Compare budget to actual
- Trend draws on funds
- Summary and detail of the disbursements
- Summary and detail of the revenues
- Remaining amount
- Either for a single agency or statewide

Cash Management

- Similar to funds management, but oriented differently
- Similar to a checkbook, showing cash available
- Track spending and revenue against budget
- Revenue forecasts and track revenues coming in
- For each fund we need date, amount, vendor
- Cash could be computed from the transaction table
Note: not sure if this is a true statement
- Cash without AR amounts is what is desired
- A typical report break down might be:
 - Agency
 - Fund(s)

- Multiple line items
 - Account coding for grant(s)
 - Account code
 - Program
 - Dept

Integrity & Reconciliation Mart

A mart that would contain key balances and reconciliation figures, run-to-run counts for key jobs and the results of “canary queries” that would help ensure the integrity of the system. Making this information available to users in a relatively digestible form would enable them to verify their reports and assist OBM in resolving issues, potentially shortening the time necessary to close every month.

Audit Support, Close Process and CAFR Reporting

These are lumped together because they require some of the same research and some of the same reports.

Audit Support

For the larger agencies, the cost of an audit (which is required every two years) can be more than two million dollars. A significant amount of that is spent extracting the data necessary to support the audit process from financial systems. Providing the basic reports and data forensics capabilities that the auditors need could represent a significant cost savings and reduce the risk of costly errors. Auditors need ways to identify and examine discrepant transactions, verify integrity and compare various aggregates.

Close Process Support

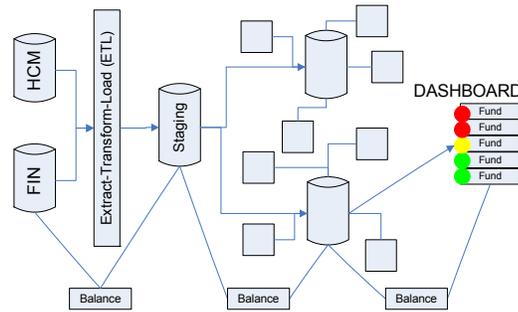
Agencies cited the time to close at the end of the month as a significant issue. There is a reconciliation period and adjustment window which did not exist before. OBM identified the reconciliation and adjustment process as a major bottleneck for closing. The key requirement is to detect certain kinds of anomalous transactions (still open particularly) and make that information available to the agencies so they can resolve them quickly. Emailed notices would be nice, to increase the incentive to resolve the outstanding transactions.

CAFR

This is a set of reports that are delivered to the Governor, summarizing the financial condition of the state. This report is currently tedious and time consuming to create. The information required to generate these reports is similar in nature to that needed to support audits, but at a summary level.

OBM Dashboard

A generic dashboard that could provide the grouping and drill down capability for the funds assigned to/handled by that agency. OBM would need another grouping layer/summary level that would help with handling the entire state.



- Other needs would be to have the transaction date and fiscal date available for reporting/grouping.
- There is also a need for diagnostic or operational reporting
- There are five required chart fields but people can enter incorrect data, which needs to be addressed in some way
 - Revenue budget/actual
 - Disbursements budget/actual
 - Available balance – general fund
 - Consolidated balance – general fund
- We do want to be able to see the whole state, all funds, all agencies and have the ability to drill down from there.
- It would be nice to be able to switch views from cash to accrual

Organizational Assessment

Part of the interview process involved talking to stakeholders that are part of the OAKS team or are service providers to them. These people were asked to comment on their own roles, their attitudes towards the OAKS and the things they felt worked well (or not so well).

We found that on the whole the OAKS staff was well aware of the issues with the current approach and implementation of the EPM environment. Many individuals, however, were not fully aware of how their work fit into the overall picture.

Both the users and the OAKS staff interviewed suggested that there were significant gaps in requirements, but it is apparent that neither group (Business or IT) is really equipped to bridge the gap without some assistance. In particular, the end users are not able to clearly articulate their requirements beyond their current most pressing issues. The IT staff do not have experience with Business Intelligence requirements and have been unable to effectively engage the users.

One especially worrisome comment from end users was that they had stopped submitting tickets and that the IT staff appeared to be unaware of this.

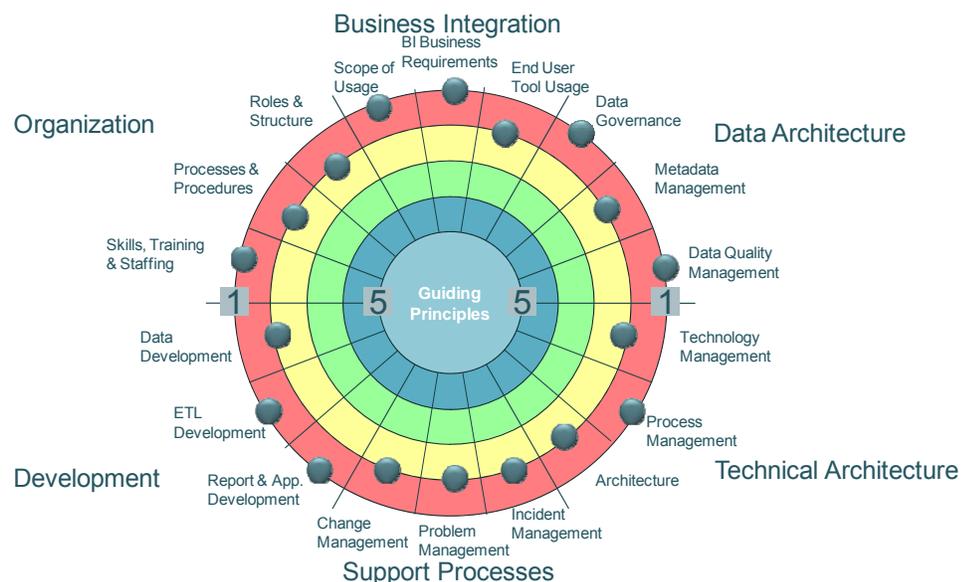
BI Capability Assessment

The BI capability assessment is intended to give an impression of how mature the BI capabilities of the organization are across 18 different areas of assessment. These are grouped into six general topics:

- **Business Integration**
Business integration addresses how well BI capabilities integrate with the business. In general, the more deeply integrated BI is integrated with the business, the more value BI is returning at the enterprise level.
- **Data Architecture**
Data Architecture addresses the disciplines of data governance, an executive level activity that formalizes the stewardship of data, data quality and metadata management.
- **Technical Architecture**
Technical Architecture examines the technology used, how it is employed and how it is managed.
- **Support Processes**
Support Processes are assessed primarily in the context of the ITIL processes:
 - Incident Management –helpdesk type processes
 - Problem Management – root cause analysis, tracking and prevention
 - Change Management – managing the changes to the system
- **Development**
Development looks at the organizations development practices across data development (data modeling, database design and data loading), ETL development and report development.
- **Organization**
Organization addresses issues with the structure of the organization, policies and procedures or staffing.

Numeric values are assigned to the observed capability in each of these areas on a scale from 1- 5. A 1 means that the organization is essentially a “beginner” in that area. A 5 means that the organization has reached a level of repeatable competence and is able to reliably execute in that area in alignment with a set of guiding principles. It is important to understand that this is a snapshot and captures only the present state of the areas examined.

The results are summarized below:



The overall assessment of the BI Capability and Maturity of the OAKS EPM organization is that they are just beginning to address most of the areas assessed. It appears from interviews that the organization has not been well managed until recently and that may account for the discrepancy between having a data warehouse in production and still having immature processes.

Business Integration

Assessment Area	Assessment Topic	Description	Observed Maturity Level	Description of Maturity Levels
Integration of BI with Business	Scope of BI Usage	Scope of BI usage refers to the depth of penetration of BI usage into the business processes of an organization, how well integrated it is and how effectively the BI environments capabilities are being exploited.	1 - BI usage is ad-hoc. Some job aids are provided, but little effort has been made to ensure that usage is consistent. Usage is entirely at the operational reporting level. We observed that some agencies have achieved more effective use of BI for their agency specific data.	1- Any use of BI is largely ad-hoc and is generally limited to static reports. No mechanisms are in place to ensure consistency of usage. Focus is on operational reporting. 2- Use of BI is systematic with some governance mechanisms to ensure consistency of usage. Reporting may be static or interactive. Includes operational and some management reporting. 3- BI use includes management and operational reporting as well as more advanced applications/dashboards to enable linking management level trends to detailed transactional events. 4- BI is employed throughout the enterprise with a focus on management by exception and sophisticated analysis capabilities including data mining, guided analysis and trend/pattern recognition. 5- BI is fully integrated into business processes and applications. Automated decisioning or decision feedback loops are employed to continuously improve the decision-making within the enterprise
	BI Business Requirements	Comprises the existence or process for capturing accurate business requirements.	1 - BI Business requirements have not been gathered effectively. There are no consistent methods for gathering such requirements or tool support for capturing and organizing them.	1- BI Business requirements gathered in a largely ad-hoc fashion. Some solutions may be deployed without reference to business requirements. 2- BI Business requirements gathered consistently, but without any particular methodology or tool support. 3- BI Business requirements gathered systematically and consistently. Solutions evaluated based on meeting the requirements. May or may not have methodology or tool support. 4- BI business requirements gathered using a methodology, usually with tools support. Requirements traceability established through development and testing process and solutions evaluated based on requirements. 5- Full requirements traceability with tool support. Consistent methodology employed through requirements, development and testing. Solutions evaluated based on requirements.
	End- User Tool Utilization	Evaluates the usage of end-user BI tools in the enterprise. Particularly whether the tool's capabilities are being well exploited.	2 - End user tools have been correctly deployed. There is a great deal of functionality that is not being utilized. Some training has been provided and some job aids do exist though the quality is uneven.	1- Tool(s) deployed. May not be fully implemented or correctly employed. Consistency of usage not enforced. 2- Tool(s) correctly deployed, functionality available, but possibly not used. Minimal consistency of use provided through training and job aids. 3- Tool(s) correctly deployed, advanced functionality available and made available to users, either through centralized development or comprehensive job aids. 4- Tool(s) correctly deployed, advanced functionality in use for some applications. Power users enabled through training, documentation or a centralized development to use all features of the tools for solving business problems. 5- Advanced features of tool(s) in regular use throughout the enterprise. Clear understanding among users and developers of the capabilities of the tools.

Business integration addresses how well business intelligence supports the needs of the organization. Some of the key observations in this were that usage of the OAKS provided data is crippled by the Operational Reporting Warehouse implementation and that the limited training and self service strategy have made Cognos dramatically underutilized.

The Cognos environment itself however has been correctly deployed and appears to be reasonably sized for the near term projected number of users. Some of the training provided in the form of “labs” (training the user using their own reports and data) is considered quite effective by users with the caveat that it could be improved if the people doing the training were more familiar with the data available.

Assessment Area	Assessment Topic	Description	Observed Maturity Level	Description of Maturity Levels
Data Architecture	Data Governance	Data Governance refers to the enterprise level policies and processes that define how data is managed. This includes stewardship and data quality.	1 - Data governance is not pursued as a discipline within the OAKS organization. In particular, data stewardship and data quality are not addressed in any systematic way.	1- Data governance does not exist as a discipline. Some ad-hoc policies and procedures may exist with varying levels of communication and enforcement. 2- Data governance exists, but does not have effective policies or procedures. 3- Data governance exists, but not at the enterprise level. Policies and procedures exist, but may be inconsistently communicated or followed. 4- Enterprise level data governance is in place, but policies and procedures may not be effectively communicated or followed. 5- Enterprise level data governance is in place and policies and procedures are well communicated and followed throughout the enterprise.
	Metadata Management	Metadata management refers to the collection and dissemination of metadata. Design metadata like definitions, lineage, operational metadata and quality metrics are all important components.	2 - Metadata is collected, but the quality is very inconsistent. The data dictionaries available to the end users would be useful if they were of more uniform quality and if the definitions were uniformly derived from the business rather than from PeopleSoft or technical terms.	1- Metadata is not consistently collected or made available to the end users. In the development process it is tool centric and may not match across tool boundaries. 2- Metadata is not consistently collected. Metadata available to end users may not be reliable or in a form that they can use. 3- Metadata is collected at various points in the development process, but is not necessarily well integrated. Some metadata is available to the end users in the form of data dictionaries that are reliable and useful to business users. 4- Metadata is available throughout the development process. End users are able to use the metadata to locate information and ascertain its source, meaning and quality. Some inconsistencies may exist in the metadata, but review processes are in place. 5- Metadata is fully integrated throughout the development process with automated tool support. End users are able to effectively use the metadata to locate information and to ascertain its source, meaning and quality.
	Data Quality Management	Data quality management refers to processes used to assure that data is of high quality. This includes data profiling, error detection and correction, reconciliation and balancing and correction of data errors at the source systems.	1 - Data quality is not managed throughout the BI environment. Reconciliation is an issue. Data entered incorrectly at the source system is not identified other than by end-user observation. Several efforts are underway to achieve manual processes for validating key financial figures.	1- Data quality is not managed throughout the BI environment. Reliable processes for error detection and correction mechanisms are not in place and automated support is limited. Manual balancing and error checking may take place but is not systematic or effectively communicated. 2- Data quality is managed, but possibly in a disconnected fashion. Some automated support may exist and manual balancing and quality controls are in place. 3- Data quality is managed end to end within the BI environment. End users may or may not be informed of issues effectively. Automated error detection exists, but may not be comprehensive. 4- Data quality is managed end to end within the BI environment. Automated balancing and error detection mechanisms are in place. Effective communications exist to notify end users of issues and resolutions. 5- Data quality is managed end to end with established closed loops with the source systems and end-users. Standards are in place and are well communicated and understood by developers and users.

End-user metadata is provided with published data dictionaries and through tooltips in the Cognos environment. The following is an analysis of one table's metadata. The definitions shown are from the data dictionary. Please note that this is not an isolated instance, but is representative of the overall state of metadata.

Business Metadata Design			
TABLE BUSINESS NAME	TABLE BUSINESS DESCRIPTION	FIELD BUSINESS NAME	FIELD BUSINESS DESCRIPTION
OAKS Commitment Control Ledger Reporting Table	The Commitment Control Ledger Reporting Table holds information about the ledger balances for each budget, pre-encumbrance, encumbrance, and expense ledger for all accounting periods and fiscal years. The various tables are pulled into one easy-to-use reporting table.	Account	The Account Characterfield is used to specify the balance sheet account or operating account (i.e. expenditure or revenue object codes) on financial transactions. Required on all transactions.
		Accounting Period	The period of time to which the transaction was posted.
		Business Unit	The Business Unit represents an agency or sub-set of an agency that is independent with regard to one or more operational or accounting functions.
		Currency Code	The code used to represent the type of currency (USD = US dollars) being used on the transaction. Defaults to the base code currency for the ledger group.
		Department Identifier	The Department Characterfield identifies the financial management organizationally entity associated with a particular financial transaction. The State will use this Characterfield to capture the State and agency organization. Required on encumbrance, expense, and revenue transactions.
		Fiscal Year	The Budgeting and Accounting Year.
		Commitment Control Budget Entry Type	The field used to designate a journal entry as a type of adjusting entry for Commitment Control.
		Commitment Control Budget Entry Type Description	The field used to designate a journal entry as a type of adjusting entry for Commitment Control for Xlat value.
		Ledger	A ledger is a set of posted balances that represents a set of books for a business unit. Ledgers store the posted net activity for a set of Characterfield values by accounting period and by fiscal year.
		Ledger Group	A group of ledgers that comprise the structure of a control budget definition. Often used synonymously with budget definition.
		Statistics Code	A field for designating a code for the type of any non-monetary amounts which are to be captured in the GL Journals. An example might be a code for "Floor Space." A unit of measure is designated for any Statistical Code.
		Activity Identifier	Activity Id
		Affiliate	Affiliate
		Fund Affiliate	Fund Affiliate
		Operating Unit Affiliate	Operating Unit Affiliate
		Base Currency	Base Currency
		Budget Period	Budget Period

Not Complete

Not Complete

Not Complete

OK

Characterfield? Technical, type of data.

Not Complete

Not Complete

Not Complete

Characterfield? Technical, type of data.

Not Complete

OK

Tautology

Tautology

Tautology

Tautology

Tautology

Tautology

Tautology

The tooltips in Cognos are sometimes a bit better in some places, similarly uninformative in others:

Better...

Name: Vendor ID

Description: A unique number assigned to Vendors entered into the Accounts Payable system.

Name: Vendor Set ID

Description: An identification code that represents a set of control table information or Table Sets. A Table Set is a group of tables (records) necessary to define your companys structure and processing options. A set of vendors are identified by a Set ID.

Not so good...

Name: Agency Use Description

Description: Agency Use Description is free flow text up to 30 characters.

The metadata repository that is part of DataStage is not used (this is typical of PeopleSoft implementations as a large part of the ETL comes packaged).

No data modeling tools are used to capture metadata at the design stage.

Data statistics and run-to-run totals are not tracked.

Data quality information is not tracked.

Data issues are not tracked as part of the Problem Management Process.

Technical Architecture

Assessment Area	Assessment Topic	Description	Observed Maturity Level	Description of Maturity Levels
Technical Architecture	Technology Management	Technology management is the management of infrastructure, upgrades, performance and capacity.	2 - The infrastructure is managed, but there is no coordinated performance or exception information available across the environment. Low level availability is monitored, but high level availability is not. Performance and capacity planning are not approached in a systematic way. Upgrade planning does not appear to be coordinated.	1- The technical environment is effectively unmanaged or only managed on a reactive basis. 2- Infrastructure is managed, but there is no coordinated effort to tie together the information available. 3- The infrastructure is managed and automated processes are in place to communicate exceptions. Processes and procedures exist for key areas. 4- The infrastructure is well managed in a proactive fashion with automated monitoring playing a key role. Key disciplines like capacity planning are execute proactively with accurate data. 5- The infrastructure is managed proactively and automatically as much as possible. Key processes are executed proactively and with a fully integrated perspective that is coordinated with evolving business requirements and planned development.
	Process Management	The reliability, monitoring and documentation of technical processes involved in operating the BI environment.	1- While most BI processes tend to be fairly reliable, scheduling issues and erratic performance have made key ETL processes a problem. Jobs are monitored, but some failure conditions do not seem to be detectable with the current monitoring capabilities.	1- Processes may be unreliable and are not well documented. Monitoring may be used but only addresses a small set of conditions. 2- Processes are largely reliable, but may not be well documented. Monitoring may be used but is not pervasive and can only detect a limited set of conditions. 3- Processes are largely reliable and are well documented. Processes may be automated or not. Some monitoring capability exists and is used. 4- Processes are largely reliable and automated. Monitoring is effective and processes are well documented. 5- Data warehouse processes are reliable and monitored so that issues are detected proactively (before the data is seen by the end user). Processes are clearly documented in such a way that it is possible to perform impact analysis.
	Architecture	Evaluation of the architecture for appropriateness, manageability, performance and scalability.	2 - The architecture is appropriate in general. Some choices like running Data Stage on the database server are questionable when combined with the use of materialized views. The database models used are not a good fit for the intended use. From an end-user perspective the performance is unacceptable. Configuration management seems to be only partially implemented with limited tool support.	1- The architecture is inappropriate for the intended use. 2- The architecture is appropriate to its intended use, but may have issues in performance, manageability or scalability. 3- The architecture is appropriate to its current use, is manageable, has reasonable performance and can be scaled to meet known requirements. 4- The architecture is appropriate to its current use and is aligned with known future requirements. Is currently well managed and has enough performance "headroom" to meet known requirements. It is scalable to support as yet unknown requirements. 5- The architecture is appropriate, well managed, scalable and performs well. There is an architectural review process and a roadmap in place to cover known requirements incorporating known vendor strategies.

The technical architecture is in general reasonable for the level of requirements being placed upon it. Tool support is missing in some key areas like configuration management and the processes in place are not adequate to make up for it.

Performance is not acceptable give the current database design and usage. With a better design, it is likely that performance would be adequate. The platform (Oracle RAC) can be scaled to meet future needs.

The current deployment of ETL processing on the same hardware platform as the database engine is likely to become a performance issue if it is not already. Moving the ETL to a separate hardware platform should be considered.

The choice of using materialized views as an ETL technique should be reconsidered as should the policy of completely reloading every table in the ORW instead of doing updates.

More extensive use of Oracle performance enhancing techniques like partitioning and additional indexes should be considered.

Support Processes

Assessment Area	Assessment Topic	Description	Observed Maturity Level	Description of Maturity Levels
Support Processes (based on ITIL)	Incident Management	Incident management refers to the process by which interrupted service is restored. A key part of Incident management is having SLAs in place.	2 - Incident management procedures do exist and a CRM system is used to track requests. There are however, several separate systems and the process of linking activity between them is manual. There are no SLAs or SLA reporting. Interviews with staff elicited no meta analysis of incidents to determine root causes or common threads. Some problems may be viewed as unsolvable at the moment.	1 - Incident management is largely ad-hoc, with little or no tool support. 2 - Incident management processes and procedures are in place and generally followed. Tool support exists. 3 - Incident management processes and procedures are in place and generally followed. Tool support exists and SLA's are in place for users and providers. 4 - Incident management processes and procedures are in place and rigorously followed. Integrated tool support exists allowing seamless tracking of issues across the organization. SLAs are in place and compliance is monitored and reported. All stakeholders have full visibility into the resolution process. 5 - Incident management processes and procedures are in place and rigorously followed. Integrated tool support exists allowing seamless tracking of issues across the organization. SLAs are in place and compliance is monitored and reported. All stakeholders have full visibility into the resolution process.
	Problem Management	Problem management is the process of identifying common incidents and their root causes and attempting to prevent recurrence.	2 - Help tickets are tracked, reported on and analyzed on an ad hoc basis. Although a process is followed there appears to be no documentation or instructions for the process. The process is currently in flux as new management reviews the process.	1 - Problems are tracked at the incident level. 2 - Problems are tracked, categorized, reported upon and analyzed 3 - Problems are tracked, reported and analyzed. Frequent/severe problems undergo root cause analysis and steps are taken to prevent recurrence. 4 - A formal review process exists for problem management. 5 - A formal review process exists for problem management and the support organization has a continuous improvement cycle based on reducing recurrence.
	Change Management	Change management refers to the processes used to document, approve and manage change implementation.	2 - (Provisional) The change control process is being revised. During the transition, the process changes have yet to be effectively communicated. From an end user perspective notification of changes has not been adequate.	1 - There is a change control process but it is not clearly documented or communicated. Changes may be documented, but standards vary depending on which team is doing the change. 2 - There is a change control process that may or may not have too support. Changes are documented but not rigorously. Backout procedures may or may not exist for all changes. 3 - There is a change control process that may or may not have complete tool support. Changes are generally well documented along with backout procedures. 4 - There is a tool supported change control process (possibly not integrated). Changes are thoroughly documented along with backout procedures. 5 - There is an integrated change management process with tool support that includes both automating changes and detecting changes in addition to managing an approval process. Changes are fully documented, along with backout procedures.

According to users interviewed, the level of support is generally inadequate. Their issues focus on:

- Support staff not knowledgeable about the data
- Tickets not effectively tracked to resolution
- Long delays for even simple requests
- Changes not communicated effectively
- The same problems keep happening

OAKS staff echoed many of the same concerns. The issues found are addressed in other sections of the report.

Development

Assessment Area	Assessment Topic	Description	Observed Maturity Level	Description of Maturity Levels
Development	Data Development	The disciplines and methodology around developing data models and databases.	2 - Some standards do exist. There is no tool support for data modeling. Data modeling does not appear to be recognized as a distinct discipline.	1 - Data modeling and database design are largely an ad-hoc process. Tool support may or may not exist. 2 - Some standards exist for data modeling and database design, including naming standards. Tool support may or may not exist. 3 - Standards exist for all key aspects of data modeling and database design and are generally followed. Tools support may or may not exist. 4 - Standards exist for all key aspects of data modeling and are generally followed. A QA process exists to very compliance. Tool support may or may not exist. 5 - A methodology including standards is followed for data modeling and database development activities with tool support. A QA process is in place.
	ETL Development	The disciplines, methodology and processes around ETL Development	1 - ETL is largely on an ad-hoc basis. Documentation is minimal and little is available in the way of standards.	1 - ETL development is largely an ad-hoc process 2 - ETL development does follow a general software development methodology with some standardized documentation and templates. 3 - ETL development has a well documented methodology which is followed. Code review and QA processes exist. 4 - ETL development has a well documented methodology and rigorous code review and QA processes. 5 - ETL development has a well documented methodology, rigorous code review and QA processes and has a closed loop with defect tracking for continuous improvement in the process.
	Report & Application Development	The disciplines, methodology and processes around report or BI application development.	1 - Report development is largely an ad-hoc process, occurring as it does at the agency level. Some developers are quite methodical in documenting their requirements, but there is little in the way of standards or documentation templates available. There are "report books".	1 - Report/Application development is largely an ad-hoc process 2 - Report/Application development does follow a general software development methodology with some standardized documentation and templates. 3 - Report/Application development has a well documented methodology which is followed. Code review and QA processes exist. 4 - Report/Application development has a well documented methodology and rigorous code review and QA processes. 5 - Report/Application development has a well documented methodology, rigorous code review and QA processes and has a closed loop with defect tracking for continuous improvement in the process.

Development practices are generally immature. This includes Data Development, ETL Development and Report Development. Key elements missing include:

- Standards
- Templates
- Well documented processes for:
 - Change Management
 - Configuration Management
 - Quality Assurance
 - Requirements Management
- Version Control Mechanisms
- Consistent Metadata Capture

Data Development

There do not appear to be well established standards or practices for data development. Data development includes data modeling, data quality analysis and other related disciplines. There is no tool support for these disciplines and there do not appear to be specific roles assigned for it within the organization. Lack of expertise in this area is one of the root causes for the design issues in the current environment.

ETL Development

The ETL development team seems to be very capable on an individual level. The development process, however does not seem to be well documents or supported with standards, templates and other job aids that help enforce consistency. This lack of consistency has manifested itself in a number of ways, making it difficult to know what information can be relied upon.

Example:
 For some of the jobs, the job description does not match what job actually does and

some jobs even have different descriptions in DataStage Manager and DataStage Designer

Job: OH_J_ORW_PS_OH_GRANTS

DataStage Manager Description: This server job (Dttm Incr Logic) is used to load data from source table. PS_JRNL_HEADER to staging table PS_JRNL_HEADER.

DataStage Designer Description: This Job extract data from the source tables PS_OH_GRANT_TBL and PS_OH_GRANT_TBL2 and populates PS_OH_GRANTS in ORW.

Report Development

Report development is somewhat fragmented within OAKS, with several different report writing groups existing. This combined with separating the SMEs from the report writers has made responding to user’s needs an uphill battle. OAKS has not provided good guidelines templates and other aids that would help insure good results. Processes from requirements gathering to QA are not well defined or documented.

Organization

Assessment Area	Assessment Topic	Description	Observed Maturity Level	Description of Maturity Levels
Organization	Roles and Structure	The alignment of the organization with its BI mission in terms of structure and roles.	2 - The roles and responsibilities within the organization are not clearly documented and do not appear to be fully implemented. Key processes like change control are being redeveloped.	1- The organization is not well aligned with its BI mission and does not have well documented roles and responsibilities. 2- The organization may be aligned with its BI mission but roles and responsibilities have not been fully documented and may not be fully implemented. 3- The organization is aligned with its BI mission, but roles and responsibilities are generally not well understood. Handoffs tend to be ad-hoc. 4- The organization is aligned with the BI mission. Roles and responsibilities have been documented but may not have been fully implemented. 5- The organization is aligned with its BI mission. Roles are clearly identified and documented. Responsibilities are clear and handoffs well understood.
	Processes and Procedures	The documentation and adherence to established processes and procedures.	2 - Processes and procedures exist for many functions, but are not fully implemented. The documentation is often out of date. (note this only applies to the EPM environment)	1- Processes and procedures are largely ad-hoc and poorly documented if at all. 2- Some processes and procedures are documented but may not fully implemented. 3- Processes and procedures are documented and implemented, but may not be reliably and repeatably executed. 4- The organization has well documented processes and procedures. The processes are reliably and repeatably executed. 5- The organization has well documented and understood processes and procedures. The effectiveness of processes is monitored and a continuous improvement cycle exists.
	Skills, Training and Staffing	The Role/Skill fit, training and staffing levels and methods of the organization.	1 - The organization has many open positions and given the level of support that is actually required may need staff beyond what is indicated by the open positions. Training for IT staff seems fairly good, but for users it is not adequate. Staff turnovers (particularly contractors) are not managed effectively.	1- The organization is not adequately staffed and/or trained. Turnovers are not managed. 2- May be adequately staffed but does not provide adequate training. Turnovers are not managed. 3- The organization has adequate staffing levels. Training may not be adequate. Turnovers are not managed. 4- The organization is staffed appropriately with adequate training but does not manage turnovers. 5- The organization is staffed appropriately with adequate training and effective turnover management.

Overall the attitude of the organization and capability of the people is good. Many expressed interest in their work and exhibited an in-depth knowledge of their work. Many evinced knowledge of what was expected of them and a desire to do an excellent job. There were a few instances where individuals had a narrow view of the scope of their work, did not understand downstream impacts or their work products and exhibited no interest beyond that narrow scope.

Turnover, changes in management, and the ‘loan’ of individuals to OAKS have had a negative impact on work attitudes, which, in turn appears to have negatively affected performance. The loan of individuals who were not trained, did not have experience or had

no interest in the type of work they have been assigned at OAKS is a non-optimal sourcing method and is a cause of performance and quality issues.

The number of consultants and the attendant difficulty of passing expertise from that consultant (who may have years of experience) to the newly hired or transferred employee causes information and expertise to be lost each time that consultant moves on or a new OAKS employee is assigned. More than one person recommended we talk to Tony Weaver as an ideal source to interview because “he knows the whole process better than anyone else”. The transfer of knowledge was planned and appeared to be comprehensive in breadth but the information that can be expressed in multiple sets of 5-12 PowerPoint slides and multiple two hour training/overview sessions cannot transfer the depth of knowledge or experience that Tony has. This is a difficulty OAKS faces each time a consultant fills a position and then moves on to another assignment.

There are many vacant positions; the quality of work suffers without sufficient people to do the work required. Many users expressed dissatisfaction with the level of support they have received which is another indication that OAKS needs to hire additional staff to meet the needs of its users.

Technical Assessment

Architecture

Please see the Current State and Future State Architecture documents for information about the architecture.

Data Quality

Because of delayed direct access to the data, only a limited amount of data quality analysis was accomplished. Inspection of the data with respect to specific observations of quality issues by the users generally supported their observations.

There are key quality issues in that the definition of tables and columns often does not exactly match what is actually present. While many of the issues reported by users fall into this category of metadata based issues, there are also duplicate or near duplicate records in several tables. Some of these have readily identifiable causes (proper process not being followed to resolve a different data issue, for example) while others are slightly more mysterious. Some issues found are just bad design (overloaded fields, for example). Since the source systems do not perform a great deal of validation, there are often errors in the data that could be avoided by adding edits to the source system. They could also be trapped in the ETL layer if changes to the source system are not feasible.

One odd source of data quality issues has been the warehouse loading processes running while users (or other processes) are accessing the tables. This could be easily prevented by revoking access to the table during loads or by doing table renames. Improving the performance of the batch processes would also help significantly.

Performance

Performance was examined primarily from the end user perspective, both anecdotally through the interview process and through examining four months worth of report execution information logged by Cognos. The IT staff at OAKS was unable to provide:

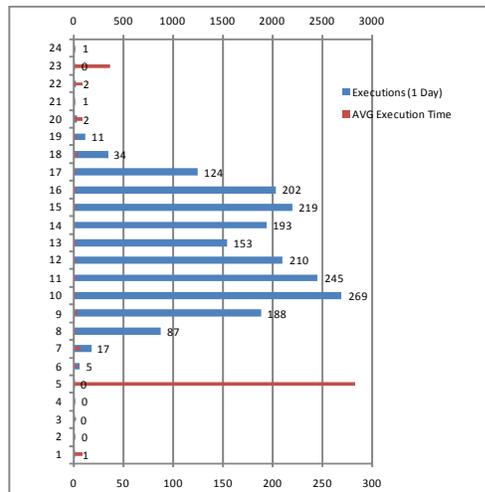
- complete batch schedule information in a form that could be used for analysis

- historical performance statistics from batch execution
- historical server level performance data

This missing information limited the amount of performance analysis that could be accomplished.

The majority of reports being run in production today, according to the audit logs, are “Unsaved” reports. This means that users are entering Report Studio, creating an ad-hoc report and running it without saving it. Because the content of these reports cannot be effectively tracked from the log information provided, these reports are disregarded for the following analysis.

The distribution of report execution throughout the day:



Based on the available report data, the current strategy of tuning individual reports appears to be useful (tuned reports are performing significantly better than untuned reports). It is apparent though that there are enormous variances in the runtime of certain reports (not clear whether this is a side effect of differing selection criteria or something in the environment). As expected, the distribution of reports run throughout the day indicates that the heaviest usage is during the late morning and early afternoon. It also indicates that there is little use of scheduled reports and that the number of reports is having little effect on the report runtimes. This last fact indicates that the Cognos environment is reasonably sized and is not a major factor in report performance.

Below, there are lists of the most erratic reports (reports whose run time varies the most), the most frequently executed report and the “heaviest” reports which are both time consuming and frequently executed. A large number of reports were “ad-hoc” and thus could not be reliably identified from the data provided. This was also noted when consultants from Cognos did a performance review of the Cognos environment.

Erratic Reports

The most common cause of erratic run times for reports is for parameters the user chooses to dramatically affect the selectivity of the queries being executed. Other than that, erratic reports tend to indicate that the reports may not be well designed or that they are not well suited to the data structures supporting them. Table scans, a lot of processing

done on the Cognos server or large joins tend to be the operations most susceptible to contention for resources, a common cause of erratic timing.

Report name	AVG (min)	Max(min)	Count	max/avg
Expenses Including Non-Posted - Journals Transactions - by Journal Date, Fund, Grant, Department, Account	2.224549	560.33698	1028	251.8879
Vouchers by Department - All Voucher Statuses - By Fund, Grant, Department	2.523513	518.41168	363	205.4325
Model 2 Executive Agency by Program Report-With Totals	0.736747	81.390831	683	110.4733
Cash Activity by Fund, by Accounting Period - Posted Transactions Only	0.809738	73.438332	182	90.69393
PCN Roster created by ITG	14.40209	1259.2864	183	87.43777
Cash Activity by Fund, by Accounting Period - Including Non-Posted Transactions	1.030581	54.250332	312	52.64052
HRCG001 Probation Performance Evaluation	3.010533	150.45517	145	49.97625
015a_Summary Expenditures By Department ID	11.32175	532.74384	109	47.05491
Cash Disbursements with Details by Fund, by Accounting Period - Posted Transactions Only	0.299059	13.9995	73	46.81178
OAKS FIN Grant Expenditure Transactions by Grant Number and Date Range	6.170311	279.6225	120	45.31741
OAKS GL Lifetime Expenditures and Revenues	20.07811	890.88135	174	44.37077
CFIS Voucher Activity Report	14.55025	617.16284	594	42.41596
044m_General Ledger Balance Report	2.764037	102.79234	171	37.1892
044_Detail General Ledger Posted Journal Transactions	1.622103	59.767666	372	36.84578
PURCHASE ORDER PAYMENT REPORT WITHOUT JRNL VCHRS 080728	2.444645	87.619667	39	35.84146
Copy of 004_Detail_Expenditures_By_Report_Id	2.156949	76.051331	98	35.25875
HRCG013 Leave Balances	20.23927	695.51514	217	34.36463
Cash Disbursements Total by Fund, by Accounting Period - Posted Transactions Only	2.991073	101.86017	41	34.05472
GL Posted Expenses - Journals Transactions - by Accounting Period, Fund, Grant, Department	1.843681	61.181	170	33.18415
Payment Card Transactions	0.995064	31.85	178	32.008
JSC AP PaymentRegisterScheduled New SORTED	12.42595	387.39883	52	31.17661
CFIS Voucher Activity Report v2	7.874824	240.60634	55	30.53387
By Purchase Order Vendor Voucher Payments	1.843554	56.248501	40	30.5109
Model 1 and 3 Data Extract	0.537323	16.303667	211	30.34239
Disbursements by ALI and Program	4.883096	147.87233	135	30.28249
GL Posted Expenses - Journals Transactions - First Report - 08052008	2.766863	81.463997	39	29.44273
Budget Ledger Including Prior Budget Periods - by Department with Accounting Class - Agency Tracking Budget	0.214343	6.1139998	109	28.52442
Vouchers - by Department, ALI - with Budget Period	0.820243	23.090334	160	28.15061
HCM - Employee Earnings EXCEL	0.38138	10.672667	50	27.98434
Monthly and YTD KWH All Funds Revenue Report	0.127439	3.5608332	57	27.94156
EPA Expense Summary For SFY 2008	18.34298	510.38217	52	27.82438
049_Payment Report by Vendor ID	137.3773	3743.4741	68	27.24959
LEC_WARRANT_JOURNALvCurrent_By Voucher ID	1.154675	31.315332	39	27.12047
FIN138PRORD - Purchase Orders	0.603688	16.158667	46	26.76657
DETAILED EXPENDITURES_080516	2.055113	54.227165	190	26.38646
FIN - Voucher Reconciliation by AccountID	7.935705	200.63467	35	25.28253
006a_Detail_Expenditures_By_Fund_Cd	7.284408	180.8945	49	24.83311
CSA Basic Disbursement w Payment Report 081308	10.04934	241.912	122	24.07243
GL Posted Expenses - Journals Transactions - by Journal Date, Department, Fund, Grant, Acct Class	3.200116	75.536003	224	23.60414
Agency OT CT Report	22.6775	520.83569	508	22.96707
3H80_ADAFL981_Adolescent_Listing by Payment Date Order	5.480989	124.7415	30	22.75894
HCM Wages and Fringe PPE - Excel	11.34191	253.90784	341	22.3867
Employee Email Addresses	11.32512	249.3455	68	22.01703
Budget Ledger 2008 Budget Period - by Department/ALI with Accounting Class - Agency Tracking Budget	0.712297	15.533334	493	21.80739
GRF Monthly and YTD Revenue Report	1.827921	38.963001	109	21.31548
Payroll Journals Posted Transactions - by Department, Fund, Grant	3.567766	75.622169	106	21.19595
Daily_Payments_Public	6.407704	132.85983	336	20.73439
014a_Detail Expenditures By Account Id	244.1032	5054.813	26	20.70768
Purchase Order Voucher Information	7.234057	149.77434	41	20.70406

Frequently Executed Reports

Frequently executed reports are prime candidates for optimization, but in this case, most of them perform reasonably. Some of the longer running frequent reports might benefit from summarized data or better parameters offering better selectivity.

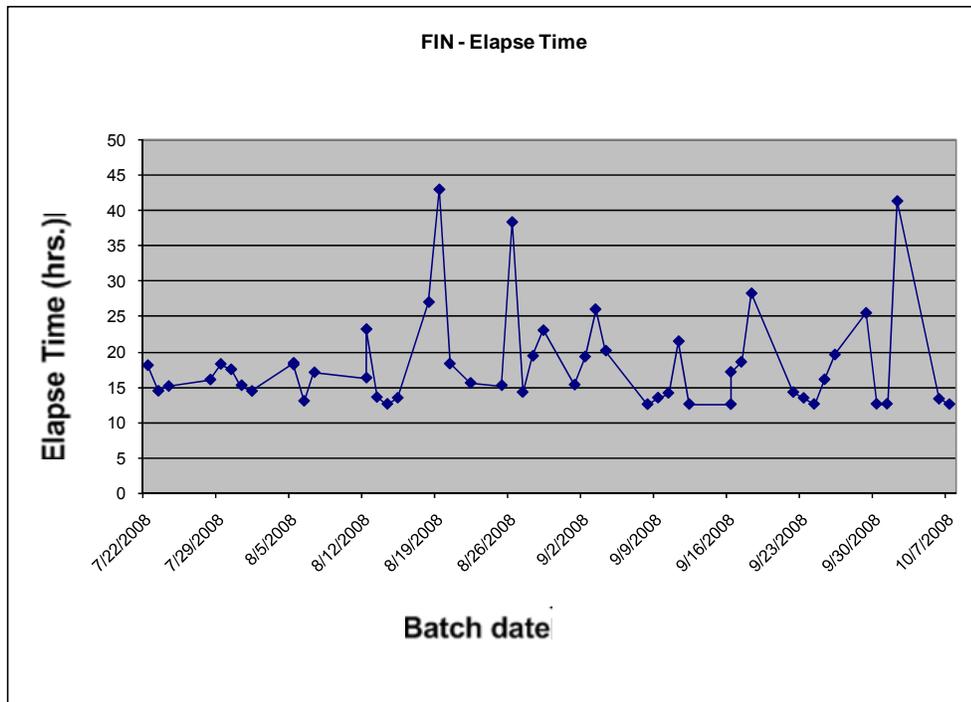
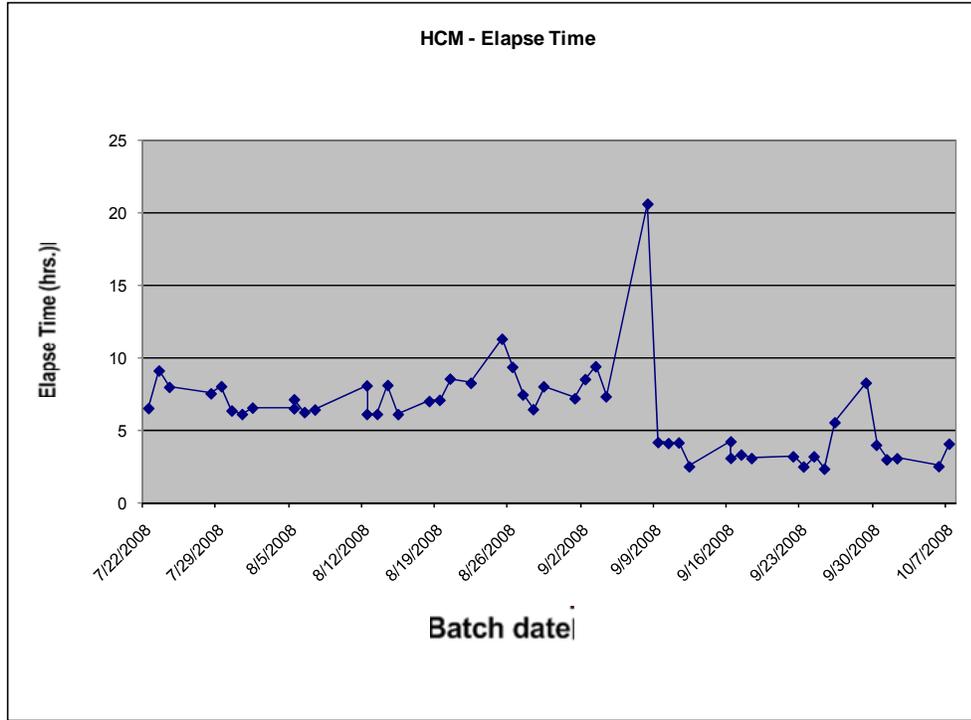
Report name	Avg (min)	Count
EHOC_Name_Report	1.198223823	26476
EHOC_SSN_Report	1.868849547	9729
Vouchers by Department - All Voucher Statuses but Denied - By Fund, Grant, Department	3.739141657	3013
Revenues - by Account, Fund, Grant	1.336750298	2748
Model 1 and 3 Executive Agency by Program Report-With Totals	0.722651903	1909
Payroll Journals Including Non-Posted Transactions (Excluding Buy-Out) - by Department, Fund, Grant, ALI	1.663525396	1673
OAKS Asset List Report	6.272568551	1551
Copy of EHOC_Name_Report	0.590057506	1481
004_Detail_Expenditures_By_Report_Id	7.549620146	1404
Encumbrance Inquiry	3.286909535	1098
003_Summary_Expenditures_By_Report_Id	6.301410656	1062
FMLA_Name_Report	0.900874401	1043
Expenses Including Non-Posted - Journals Transactions - by Journal Date, Fund, Grant, Department, Account	2.224548807	1028
DNR - T and L Approval	127.8169061	851
DNR - T and L Approval - Time Code Level	127.6125126	848
BNCG006 Earnings for WC	6.391390567	841
FIN138OPENC - Open Encumbrance Documents	4.212652145	727
FIN- Payment Card Transactions	0.431983048	706
Model 2 Executive Agency by Program Report-With Totals	0.736746695	683
002_Detail_Expenditures_By_Grant_Id	2.739390849	670
Daily_Payments	3.082573852	668
OAKS Revenue by Agency by Fund and Revenue Source (GL070)	7.054788036	650
Copy of Employee Hours Worked	1.190605262	646
CFIS Voucher Activity Report	14.55025113	594
Agency OT CT Report	22.67749965	508
Payment Journal List - by Department ID, Account ID	20.439728	495
Budget Ledger 2008 Budget Period - by Department/ALI with Accounting Class - Agency Tracking Budget	0.712296678	493
Budget Ledger 2009 Budget Period - by Department/ALI with Accounting Class - Agency Tracking Budget	0.530666264	475
FMLA_SSN_Report	0.066304886	457
PYCG008 PT Employee Hours Worked	29.86553659	415
Encumbrances - Agency Tracking Budget	7.926404514	387
CFIS Local Agency Budget Report	0.295347766	381
Warrant Cancellation or Erroneous EFT Transmittal Form v2	30.89479182	374
044_Detail General Ledger Posted Journal Transactions	1.622103484	372
Vouchers by Department - All Voucher Statuses - By Fund, Grant, Department	2.523512879	363
001_Summary_Expenditures_By_Grant_Id	1.317836674	351
AR Deposit Detail Report	0.180595375	349
All Expenses Including Non-GL Posted - Journal Transactions - by Department, ALI, Grant, Reporting Category, Acctng Class	4.120297322	343
HCM Wages and Fringe PPE - Excel	11.34190766	341
FIN - Revenue Status Detail	4.898947554	340
Daily_Payments_Public	6.407704341	336
FIN128JRNLT - Journal Transactions	5.723744714	331
FIN128TDDEP - Total Disbursements by Department ID and Account	125.43778	330
CFIS Draw Sampling by Week	4.8821311	328
Detailed Recapitulation Report	90.6639956	322
Accounting_Information_Screen	31.96529533	315
Cash Activity by Fund, by Accounting Period - Including Non-Posted Transactions	1.0305812	312
Model 1 and 3 Data Extract - With Total	0.225551666	303
FIN131DBARR -Disbursements by Administrative Responsibility, Reporting	125.2235727	302

Heavy Reports

Heavy reports are reports that take a long time to execute and are executed relatively frequently. Since this ranking represents the total load imposed by the running of each report, tuning these reports can significantly improve the overall behavior of the system. These kinds of reports are sometimes good candidates for batch execution where specific segments or views are then burst for departments or even users.

Report name	Avg (min)	Count	max/avg
Voucher Errors Cognos Report	2112.781411	117	247195.4251
Anthony Perry3	8320.166853	17	141442.8365
OAKS_VCHR_VNDR_8	1097.123804	116	127266.3613
Fed Payments - Working Draft v6	4216.896785	26	109639.3164
DNR - T and L Approval	127.8169061	851	108772.1871
DNR - T and L Approval - Time Code Level	127.6125126	848	108215.4107
Commitment_Control_Expense_AllProgam	2514.895453	42	105625.609
041_Current Balance of Open Purchase Orders for a Department	280.5058385	301	84432.25739
119_Expense Detail from Voucher Accounting Info	1140.056592	53	60422.99936
VoucherAccountingExtract	272.1838746	188	51170.56842
FIN128TDDEP - Total Disbursements by Department ID and Account	125.43778	330	41394.46739
JournalExtract	204.651752	188	38474.52937
FIN131DBARR -Disbursements by Administrative Responsibility, Reporting	125.2235727	302	37817.51894
EHOC_Name_Report	1.198223823	26476	31724.17393
voucher id vendor id	309.5638311	95	29408.56396
Detailed Recapitulation Report	90.6639956	322	29193.80658
Warrant Journal List	104.4221851	269	28089.56779
FIN128TOTDB - Total Disbursements by Department Group and Account	163.5164954	153	25018.0238
024_JFS Canceled Warrant/EFT Report with Coding	109.6054969	220	24113.20931
VoucherExtract	110.5526041	188	20783.88958
Rpt_Voucher_Spending	161.9586792	123	19920.91754
EHOC_SSN_Report	1.868849547	9729	18182.03724
TimeLaborPayable_Extract	187.2715624	95	17790.79843
OAKS_VCHR_VNDR_JFS04	144.9691632	117	16961.3921
Objects of Expense with All Chart Field Parameters_080205	68.48922565	232	15889.50035
150_Earl_Oaks Employee Master Outbound Interface Report Table	132.4477664	118	15628.83644
all Paid Vouchers with detail	209.5483678	73	15297.03085
OVS_Open_Voucher	433.0820982	34	14724.79134
OAKS GL All Journals by Chartfield	52.0543949	278	14471.12178
Fed Payments - Working Draft with Grant	7026.27	2	14052.54
EMA FY08 Payroll - All Funds - Posted Transactions Only (developed 3-3-08)	13623.333	1	13623.333
018dct_Summary of Paid Travel Vouchers	143.9213825	94	13528.60995
PYCG008 PT Employee Hours Worked	29.86553659	415	12394.19769
VoucherData	161.7369068	74	11968.5311
CFIS Funding Source Over/Under v3	1054.194876	11	11596.14363
Warrant Cancellation or Erroneous EFT Transmittal Form v2	30.89479182	374	11554.65214
Agency OT CT Report	22.67749965	508	11520.16982
Vouchers by Department - All Voucher Statuses but Denied - By Fund, Grant, Department	3.739141657	3013	11266.03381
022_Report View - Unpaid Voucher Status Query (Maintenance Unit)	109.9366038	100	10993.66038
004_Detail_Expenditures_By_Report_Id	7.549620146	1404	10599.66669
VendorTotalsByOrgUnit	66.25393443	158	10468.12164
Non-PayrollAdmin	951.4092212	11	10465.50143
Rpt_Transactions	75.18078401	135	10149.40584
Payment Journal List - by Department ID, Account ID	20.439728	495	10117.66536
Accounting_Information_Screen	31.96529533	315	10069.06803
022_Report View - Unpaid Voucher Status Query (Subsidy Unit)	111.1638055	89	9893.578687
OAKS Asset List Report	6.272568551	1551	9728.753823
HRCG012 Leave Balances - DRC	145.3250822	65	9446.130343
FIN-DNR750-BudgetCheckErrors	82.21651444	114	9372.682646

Performance data from the database servers and information about the batch schedule was insufficient for a complete analysis. Anecdotally (from interviews with the OAKS team), database performance in general is not a problem although the performance of queries on specific tables is. Further, the batch schedule is described as being erratic, with jobs taking unexpectedly long to execute. A side effect of this is that the end users are unable to access the data they need first thing in the morning (the SLA is 8:00AM). This is mostly attributed to the use of materialized views as an ETL technique and to using destructive loads for most tables (even very large ones). The erratic behavior may be caused in part by the fact that the batch schedule is not tightly controlled, leaving the exact mix of processes running at any particular time quite variable. Below are graphs of the runtimes for each of the HCM stream and the FIN stream.



Security

Security is role based and row level. It is managed using a Cognos “Custom Security Provider” that links to PeopleSoft. A risk going forward is that this component will have to

be maintained when PeopleSoft and/or Cognos upgrades occur. We were unable to determine conclusively whether Cognos had ended support for its own PeopleSoft EPM integration components due to some apparent confusion within Cognos (now part of IBM). Hopefully this will be clarified in the near future.

The security provider did not appear to have a significant impact on performance.

Because of the sensitive nature of some of the data held in PeopleSoft, OAKS needs to develop a scheme for at minimum obfuscating some information when populating development and QA environments. Encryption for the database may be a viable option, at least for the identifying information. Some information like salary probably should not be encrypted as it would impose a significant performance penalty.

Solutions to this problem tend to be significant undertakings, but the risks of unintentionally revealing large amounts of personal information probably make this an absolute requirement.

Broadly speaking, there are two general approaches to securing information when working with a commercial package on top of a commercial database. One is to use a software product that does database level encryption of the fields. The other is to obfuscate the data in some fashion for non-secure environments.

It should be noted, however, that the common practice of downloading large amounts of information to spreadsheets for subsequent analysis increases the exposure for breaches of privacy policy.

Tool/Technology capability usage (e.g. materialized views)

Overall the tool and technology usage is fairly “vanilla” with the exception of the use of materialized views as an ETL technique (or more properly ELT). This is an unusual practice and in general does not appear to perform well compared to using the ETL components supplied by PeopleSoft., the OAKS team is somewhat tool challenged. They do not have tools for data modeling, version control or requirements management. The organization does use SharePoint, but does not use its workflow or application capabilities extensively.

Two particular areas in which the available technology is not being exploited are in database design and in the semantic layer (Frameworks) within Cognos. The semantic layer in Cognos can do a lot more than just provide logical names for tables. Exploiting some of these capabilities in conjunction with carefully designed views could dramatically simplify writing correct reports.

There are significant performance improvements possible by implementing materialized views as they are intended to be used, partitioning and specialized index types. It should be noted though that while there are significant benefits to applying these techniques against the current database design, the full benefits won't be realized until the ORW database has been redesigned.

Ease of use and development could be vastly improved through the use of views and the Cognos Framework. Specifically, we would suggest looking at making the table structure more friendly (narrower tables, encapsulating date logic etc.).

Some of the features in Oracle 10+ that might be of use:

- Parallel Query
 - Materialized Views
 - Automated Workload Repository
 - Multiple Blocksizes
 - STAR query optimization
 - Multi-level partitioning of tables and indexes
 - Asynchronous Change Data Capture
 - Read-only Tablespaces
 - Advanced Data Buffer Management — Using Oracle 10g's multiple block sizes and KEEP pool, you can preassign warehouse objects to separate data buffers and ensure that your working set of frequently-referenced data is always cached.
- Recommendations

Summary of Recommendations

Technology

A key element of the overall approach being recommended is that the existing investments in hardware, software, training and skilled staff should be leveraged as much as possible. In that context, the following overall technology recommendations are made:

- The PeopleSoft EPM MDW should be used as the basis for developing BI solutions revolving around data from the PeopleSoft systems. At some point this will entail implementing EPM/MDW, though not “all at once”. Note that using EPM as a basis does not necessarily mean basing solutions directly on and being limited to what is available in the 8.9 release of EPM.
- Cognos should remain the BI tool of choice. While Cognos has indicated that it will no longer support direct metadata and security propagation from EPM into Cognos frameworks, this is not an absolute requirement for using Cognos with PeopleSoft EPM, especially in light of the moderate to high level of customization that will be required (see later discussion of implementation approach).
- Data Stage should be the tool of choice for ETL
- Data modeling and requirements/metadata collection tools should be employed to enable traceable requirements and more effective development (in particular we recommend Erwin as a modeling tool and Consensus as the requirements tool. Our recommendation is: Erwin with Saphir (integrates with PeopleSoft)
- Data quality and profiling tools should be evaluated for cost effectiveness vs ad-hoc development of these capabilities in the context of Data Stage. In particular, There are components available from IBM for these purposes that are now integrated with Data Stage.
- A study should be undertaken to determine if it would be cost effective to further automated metadata propagation across the various tools used in this environment. In particular, EPM, Data Stage and Cognos.
- An evaluation should be made of the hardware platform currently in use. In particular, determining whether the existing hardware is being used effectively, whether Data Stage should be moved to its own servers and whether Oracle is configured appropriately for the data warehouse environment. (there was not sufficient time to examine this in detail as part of the evaluation)
- More rigorous server and application level monitoring should be emplaced to continuously capture and report on the performance and availability of the EPM infrastructure.
- A version control tool for PeopleSoft should be considered. One example of this is STAT from Quest software. It should be noted however that this is NOT a plug-n-

play type of implementation and will require some amount of PeopleSoft savvy resources to implement.

- A version control/impact analysis tool for Cognos should be considered. One possibility is Motio/CI.

Approach

For OAKS to achieve its goals with respect to improving the way State of Ohio agencies use data to manage their organizations, the current approach will have to be changed significantly. The current approach could be summarized as:

- Put all of the data out there
- Let the users report on it however they want

There are some sound reasons for wanting to have a self service type environment, but for a self service environment to be successful, some steps need to be taken to **enable** self service. A non-IT example of enabling self service is the buffet. It certainly would be possible to cook all of the food and then just invite the diners to wander around the kitchen and help themselves to whatever they could find. Overall, this wouldn't work very well. A buffet enables self service by organizing the food for easy access (database design), labeling it appropriately (metadata) and providing the right utensils to serve it (BI tool). This is what OAKS has to do with EPM.

To achieve this, we are recommending a solution with three distinct "tracks".

- Quick hits to mitigate current issues
- Implement a business intelligence roadmap
- Mature the EPM organization

Each of these streams represents some significant challenges. The hardest part though is that there really isn't time to address them separately. They really need to be addressed at the same time.

At a very high level, we are suggesting that OAKS implement custom multi-dimensional data marts to meet specific business needs based on the models provided as part of Oracle EPM. Rather than implement it all at once, we are suggesting implementing it in slices that deliver immediate business value. The current environment would be maintained during the build out of the new environment and a series of short "Quick Hit" projects would be executed to improve the current environment as much as is practical without major redesign (which will already be going on as the EPM based data marts are rolled out). While this is going on, the EPM organization would be seeded with technical experts to help develop skills and processes with which to support developers and users in the new environment. The focus would be on fully staffing the organization and locating or developing individuals to fulfill the specialized roles needed.

Quick Hits

Restoring the users' confidence requires making tangible improvements in the existing environment, in particular, making the data available on time, improving performance, simplifying the user experience and removing some long standing annoyances such as the inability to combine financial and human resource data. To address those concerns, the recommendation is to initiate a series of quick hit "fixes" to the existing environment. These should be time boxed efforts of between two and four weeks, with the scope

adjusted to fit. The objective is to take a limited amount of time and improve the environment as much as possible in several different ways.

Based on the concerns matrix, we would recommend the following efforts grouped by the concerns which they address:

Build Trust in the Data

- Retrofit Run-to-Run and Auditing

To the extent possible in approximately four weeks, identify a few key balance points and expose those numbers. Implement simple run-to-run controls so that the EPM team can begin effectively monitoring their ETL processes. The objective of this effort is to begin understanding the balancing requirements and to provide a starting point for reconciliation efforts.

Improve Availability

- Tune Batch Schedule

Identify the jobs that are either the most time consuming or the most unpredictable and tune them for performance. Among the options for tuning are converting materialized view SQL jobs to DataStage ETL jobs and changing from destructive loads to updates.

- Assess Hardware/Performance

The current environment is not inadequate for current needs, but it is expected that the level of use will increase once some of the design issues are dealt with. While this will be balanced by the improved performance that an improved design can yield, the hardware capacity should be assessed once some of the more pathological issues have been resolved (particularly bad joins, poorly designed prompts and flat-file type tables. It is also likely that segregating the datastage environment from the database would yield an improvement in performance. This should be considered as well.

Improve Usability

- Clean Up Metadata

Currently, many definitions are not useful to the users as they do not address their business, instead being a repetition of the fields name or a technical definition. A concentrated effort should be made to ensure that for the columns that users are looking at, definitions are concise, correct and expressed in terms that the user will find familiar.

- Improve Metadata Delivery

Make the metadata easier to use by improving the delivery mechanism. Providing data dictionaries that were limited to the most needed fields, providing a view that grouped the fields logically and augmenting the dictionary with some standardized categories would go a long way towards simplifying their use.

- Develop Customized Cognos Training

The training the users received previously was largely generic. Providing training that is specific to the usage and data of the users would improve the situation.

- Create reference and tutorial job aids
- Customize standard Cognos training using examples and data the users will actually see
- Establish a link between incident management and training materials so that the problems users encounter will be addressed in their training
- Acknowledge that there are in fact several user communities and tailor training for each (power users, analytic users and casual users might be reasonable categories).

Enhance Functionality

- Enable HCM/FIN joins
Create the necessary mechanisms for users to be able to join financial and human resource data. Some additional requirements gathering will be necessary to determine what would be the minimal intervention required.
- Cash Management Detailed Analysis
While it is clear that resolving the cash management issue will take some effort, it is worthwhile to do sufficient analysis to determine if there are some steps that could be taken more quickly to meet users needs. In particular, it is likely that a report could be created that provided an “adjusted” cash balance that users would be able to use for daily operational needs.

Improve User Experience

- Mitigate Master File Table Issues
Provide users with narrower views of the widest tables, eliminating unused columns (more than 300 in one case), grouping them sensibly and addressing issues with multiple rows. The narrowing can be accomplished through a combination of physically splitting the tables, creating views and adjusting the framework models in Cognos.
- Mitigate Effective Date Issues
Provide views that allow users to avoid having to deal with effective dating on every report. This can be accomplished in a number of ways, including creating database views, manipulating the model within the Cognos Framework Manager and identifying active rows.
- Address Report Performance
Addressing report performance directly by making sure that indexes are being used appropriately, that joins are correct and that report prompts do not have a negative impact on performance will all provide immediate relief to end users. Some reports’ execution times have already been improved by more than an order of magnitude. Providing users with clear guidelines on how to write reports so that they perform adequately would also improve the situation.

From a priority standpoint, run-to-run controls and auditing, investigating cash management and tuning the batch schedule are clearly the most significant items. In terms of impact, addressing the metadata problems and report performance would provide the most improvement with the least risk. Addressing the “Master File” table issues would address several issues at the same time (performance and user experience). In an ideal world, these could all be addressed in parallel, but experience suggests that the quick hit approach would probably be more effective.

The recommendation is to start with run-to-run controls and auditing, investigating cash management and tuning the batch schedule, followed by the metadata tasks. HCM/FIN joins, Master File table issues and effective date issues all may require some physical changes to the database and to a number of reports to take full advantage of the improvements, suggesting that these changes should wait until users have seen some benefit. Finally, addressing report performance directly is something that can be done alongside all the other efforts by the performance team, but a concerted effort to improve reports should wait until some of the other improvements are in place.

To effectively address these issues the composition of the team executing the quick hits will need to vary somewhat. For most of these items, the key skills will be Cognos

development, DataStage development and database design. Some of the efforts like metadata and cash management will require business analysts as well.

BI Roadmap

Implementing the BI roadmap will involve changing to a requirements focused iterative development approach that can quickly deliver solutions that are solidly founded on users' needs. The route to achieving this is to use the PeopleSoft EPM MDW as the basis for customized subject area data marts. The most pressing business needs are Cash Management reporting and reconciliation. Satisfying these needs will resolve a lot of current dissatisfaction. The BI roadmap will enable many different levels of usage, from canned reports to complex dashboards to ad hoc query with:

- Easy to use and fully descriptive metadata
- Centrally developed and maintained shared reports and applications
- Data models that users can understand and use

The key components of the BI roadmap are:

1. Understanding agency requirements
2. Implement core solutions based on the PeopleSoft MDW model
3. Adopt a rapid iterative development process with tool support to drive 12 week cycles that each address a single subject area and key business need
4. Integrate data quality management techniques throughout and make that information visible to the user community
5. Maintain existing functionality until it can be compellingly replaced

The previous approach centered on self service, the “build it and they will come” approach. This approach has had only very limited success. The BI roadmap alters this approach to one of **enabling** self service. What this means in practical terms is:

- A central team will be responsible for a core of shared functionality that is available to all users. This may include dashboards, reports and extracts.
- The agencies will be provided with data models that are easy to understand and supported by accurate and easy to use metadata.
- Training and job aids will be developed that directly support the tasks that users need to do.
- Performance will be such that users are comfortable getting information themselves rather than having to ask someone else to do it.
- Core dashboard and interactive reporting applications developed by the EPM organization will act as catalysts to change the focus from reading reports to getting answers.

From an implementation perspective, the data warehouse environment we are proposing would be based on PeopleSoft EPM 9.0 with customized data marts to deliver the functionality required by OAKS users. Provided models and ETL would be used as much as possible.

The PeopleSoft EPM Warehouse is divided into two logical structures.

1. Operational Warehouse
 - a. Operational Warehouse Staging
 - b. Operational Warehouse Enriched
2. Multidimensional Warehouse

The Multidimensional Warehouse implemented with appropriate data quality management is the key component to enable developers and users both to rapidly and effectively deliver reporting solutions. The MDW has as PeopleSoft delivers it is composed of six data marts that have more than 400 predefined facts and dimensions. The General Ledger Data Mart , for example covers agency assets, liabilities and revenues. In other words, it provides a lot of the core functionality that is needed. Except it doesn't cater to the peculiarities of how Ohio does accounting. That's why customization is required. The predefined data marts are:

- General Ledger Data Mart
- Payable Data Mart
- Receivables Data Mart
- Procurement Data Mart
- Enterprise Service Automation Data Mart
- Spend Data Mart

Using these as a basis, implementation is a matter of exposing business requirements, identifying the gaps between what is provided and what is needed and implementing the required data mart components (only the gaps will be fully custom). The approach we are proposing does not required that each mart be implemented in its entirety. Instead, only the portions that are actually needed for a particular development iteration will be addressed.

Maturing the Organization

Roles and Responsibilities

Below is a "to be" skills matrix. Please note that some responsibilities have shifted. In particular, Cognos administration is under The OAKS Infrastructure Team, just as DataStage and DBA functions are. The green shaded are represents the core skills for people in these areas. Another difference is that there is a defined Cognos Development group. This is a requirement, going forward for the OAKS team to be able to effectively deploy BI solutions.

Office of Information Technology Technology Management Skills Matrix	Hardware and Connectivity	Operating System	Database & Utilities	Application Software	Business Rules, calculations and data
Infrastructure Services Division Unified Network Services Enterprise Computing Services - OSS Helpdesk - OCSSC Ohio Business Gateway - Webhosting Data Base Services	Expert	N/A	N/A	N/A	
OAKS - Infrastructure Team Support DBA Performance DBA, Cognos Admin, PS Admin	Knowledgeable	Expert	Knowledgeable	Trained	Trained
OAKS - EPM ETL Development Data Administration Cognos Development FIN and HCM Development	N/A	Knowledgeable	Knowledgeable	Trained	Expert
Agency - SME's and Business Process Owners OBM Other Agencies	N/A	N/A	N/A	N/A	Knowledgeable

Expert	Has had specific and generally formal training, works with the technology directly and frequently. Generally has primary responsibility for resolving issues. Carries out administrative tasks.
Trained	Has had specific and possibly formal training, but may work less directly or frequently with the technology. Participates in resolving issues and performs administrative or supportive tasks.
Knowledgeable	Is familiar with the concepts, terminology and operations of the technology, in at least a theoretical sense. Will participate in resolving issues and may perform some administrative and supportive tasks

This representation is intentionally ambiguous in not separating out the particular application, business rule and data skills needed. There needs to be a significant amount of **cross-training**. This enables a significant level of delegation within the team so that a Cognos administrator can, for example, count on a lead developer being able to handle basic Cognos framework tasks with a minimum of instruction. This effectively **leverages** the expert level skills of particular team members. This is also a key point. There need to be experts in key disciplines... “rockstars” ... for this approach to be fully successful and to truly achieve maximum leverage. It should be noted here that in software development type rolls, the star performers outperform the merely average by huge amounts (some estimates go as high as 200 times). Experts are expensive, but well worth it.

Consultants can be a good way to initially seed the teams with highly skilled people, but there must be a concerted effort to develop those skill levels in-house.

The following roles matrix shows how specific responsibilities might map across organizational boundaries. It is important to understand that someone will be doing these things.

	Data Stage	PeopleSoft EPM/DW	Cognos	Budgeting and Planning	Data Administration
Infrastructure Services Division Helpdesk	Initial point of support Tracking of incidents Directing appropriately	Initial point of support Tracking of incidents Directing appropriately	Initial point of support Tracking of incidents Directing appropriately	Initial point of support Tracking of incidents Directing appropriately	Initial point of support Tracking of incidents Directing appropriately
OAKS - Infrastructure Team Application Administration	Installation Repository administration Scripting as needed Configures adapters Technical troubleshooting Coordinate IT Service Delivery	Installation Tuning Maintenance scripting Technical troubleshooting Coordinate IT Service Delivery	Installation Driver configuration Security administration Coordinate IT Service Delivery	Installation Technical troubleshooting Coordinate IT Service Delivery	Metadata Mechanism Administration
OAKS - EPM Team Finance App. Dev. and Support - Business Applicator - Data Administrator - Master Developer - Developer - User Administration - User Assistance - Data Administration		Designs Datamarts Administers Security	Develops Reports Manages content User availability monitoring Semantic layer development Data issues User Administration	Develops applications Administers applications Develops reporting Manages data import/export User Administration	Develops applications Administers applications Develops reporting Manages data import/export User Administration
Business Process Owners & SMEs OBM	Defines & prioritizes business requirements & validates results	Defines & prioritizes business requirements & validates results	Defines & prioritizes business requirements & validates results Develops reports and dashboards	Defines & prioritizes business requirements & validates results	Sets Data Quality Standards and assures compliance
Other Agencies			Defines & prioritizes business requirements & validates results develops reports and dashboards		

Key Support Roles	
User Assistance	Provides users with information and training, coordinates response to user questions about content and data
Help Desk	Provides first point of contact for technical issues also for Application Administrators to engage Infrastructure resources
User Administration	Administers user assignment into roles and role definitions (may hand off implementation to others)
Data Administration	Monitors, troubleshoots and verifies data processes (ETL, loads etc.) does logical modeling
IT Application Administrator	Administers technical aspects of the application platform, particularly those that interact with App Server, Oracle or the OS
Business Application Administrator	Administers internal aspects of the applications, schedules processing and verifies completion
Application Developer	Develops data models, reports, dashboards, ETL data flows and other artifacts
Application Master Developer	Creates standards and templates for development, identifies and codes common functions
Combining Roles	The above roles exist for each of the applications involved, individuals generally fulfill more than one role. Viable combinations depend greatly on the skills and workload of staff members.

Special attention needs to be paid to the role of OBM and other agencies in the BI ecosystem. OBM is needs to be cast in a slightly different role than it currently occupies.

- OBM should be responsible for establishing, monitoring and enforcing the standards around data quality
- OBM should participate in requirements gathering for solutions to be developed by OAKS for use by multiple agencies as a financial SME (subject matter expert).

Development priorities for the OAKS EPM team should be set by the OAKS steering committee. Other agencies would be responsible for developing their own particular BI solutions. If they develop a solution that is applicable across the enterprise, then OBM and the OAKS steering committee need to review and approve the dissemination of the application and may recommend that maintenance and enhancement be taken over by the OAKS team if it seems appropriate.

From examining the current OAKS EPM organization, there are a couple of key roles that stand out as not being adequately filled.

- Release Manager
There should be a person responsible for each release of data warehouse functionality. They will be responsible for coordinating development, testing and ultimately approving the release. They will also be responsible for coordinating any stabilization or fixes required after the release. Ideally there should be two people

fulfilling this role to enable the most rapid development cycles possible. This individual is also a data quality gatekeeper, ensuring that appropriate checks and balances are in place for each release.

- **Cognos Master Developer (Architect)**
The master developer role should be filled for each of the key tools supported out of the OAKS team. In particular, there does not seem to be a Cognos master developer on the team.
- **Data Architect**
The data administrator role is responsible metadata and possibly data quality analysis. The data administrator is also responsible for tracking data stewardship, which is part of the larger data governance process.

Process

A key requirement going forward will be for the OAKS team to document key processes. This documentation effort appears to be under way and several processes are being reworked, including the change control process.

Currently the processes in need of formalization include:

- **Change Management**
Change management encompasses how changes are requested, tracked, approved and communicated. Best practices dictate that these processes be among the most formal in a development organization and that there be easy visibility into both the process and the results. Tool support for monitoring changes can be a useful adjunct to the change management process, helping to assure that changes made outside the process do not go undetected.
- **Configuration Management**
The aspect of configuration management most pertinent to a development organization is version control for source. As the number of developers increases or they become more dispersed, tool support for versioning becomes essential. All primary artifacts like reports, DDL and models should be version controlled. The mechanisms for doing this can range from fairly primitive (defined directories and naming standards for storing artifacts) to sophisticated (version control integrated with all tools)
- **Performance and Capacity Management**
The review of performance and capacity should be a regular process, executed on some interval (weekly, monthly or quarterly depending on the needs of the organization). This includes the growth rates of tables, the use of temporary space, batch run times and trends in query performance.
- **Incident Management**
Incident management needs most of all to have process integrity and transparency. It is imperative that issues not be “lost” during handoffs or while waiting for service and that not only the incident resolvers, but the users as well be able to “see” into the process.
- **Problem Management (being done within the FIN team)**
The extension of Incident Management with incident review processes, root cause

analysis and a proactive approach. Review of incidents should be a weekly process that identifies trends, repeating problems and root causes.

- **Requirements Management**
Requirements are a big gap for the OAKS EPM team. Requirements need to be gathered, organized, stored and tracked. Every change made should be traceable to a requirement that is documented and attributed.
- **Testing, Review and Signoff for EPM changes (as a development process)**
Currently these processes are somewhat ad-hoc. These processes need to be brought under a single umbrella of release management and effectively communicated. Because of the agency based development strategy, any change made in the EPM “back office” (ETL, database etc.) has the possibility of impacting a large number of users.
- **Development standards for database, ETL and for Cognos**
Having clear standards, templates and examples for developers (whether within OAKS or for agencies developing their own reports) would improve the quality of the reports and significantly simplify troubleshooting for the OAKS team.
- **Data Governance (including data quality, metadata management, stewardship etc.)**
Data governance roles are generally filled by existing staff and management. The key is that a high level decision needs to be made to designate individuals within each organization as being **responsible** for the correctness of the data they provide. These responsible parties are called **Data Stewards**. A key part of implementing effective data governance will be equipping these stewards with the tools they need to determine if they are providing high quality data. This is part of why the results of canary queries, run to run controls and other data quality monitoring processes needs to be visible to users.

Delivery

The key changes we propose in terms of delivery are:

- The use of data modeling
- A methodology and tool support for capturing business requirements
- A rapid development methodology for BI solutions that partners front to back starting with requirements that drive a dimensional model that then drives Cognos report and dashboard development and a simultaneous back to front approach to building the data extraction, transformation and quality management components necessary to supply data.
- The development of a BI solution center of excellence within OAKS to provide and maintain the solutions that will be used across all agencies and to support agencies in developing solutions for their own particular needs.

Next Steps

- Create an RFP for the implementing the BI roadmap that includes requirements for:
 - Requirements based development
 - Rapid delivery cycles 12 weeks
 - Approach that maximizes compatibility with future PeopleSoft upgrades
 - Addressing the problems in the existing environment
 - Providing verifiable data quality and integrity metrics
 - Continues support for the current environment
- Begin executing on some of the recommendations made
 - Report tuning (already under way)
 - Batch tuning
- Begin to address the organizational issues
 - Staff the current organization
 - Create new roles and document the existing ones
 - Continue to document and refine processes
 - Focus on root cause analysis while clearing the support backlog

Appendices

Identified Business Processes

These represent the primary identified financial processes:

1. CASH MANAGEMENT
2. FUND MANAGEMENT
3. GRANT MANAGEMENT
4. GENERAL LEDGER
 - a. Spreadsheet Journal Entries
 - b. Budget Journals
 - c. Grant Attributes
5. VENDORS
 - a. Vendor Entry
 - b. Vendor Maintenance
6. ACCOUNTS RECEIVABLE
 - a. Entering Customers
 - b. Entering Pending Items
 - c. Maintaining Customers and Pending Items
 - d. Entering Deposits
 - e. Corresponding with Customers
 - f. Creating ISTVs
7. PURCHASING
 - a. Creating Requisitions
 - b. Approving Requisitions
 - c. Managing Requisitions
 - d. Managing Purchase Orders
 - e. Managing Receipts
 - f. Managing Return to Vendors (RTVs)
8. ACCOUNTS PAYABLE
 - a. Creating Vouchers
 - b. Using Control Groups
 - c. Voucher Approval
 - d. Maintaining Vouchers
 - e. Electronic Commerce
 - f. Billing
9. BUDGET
 - a. Payroll forecasting
 - b. Expenses forecasting
 - c. Review and Approval
10. ASSET MANAGEMENT
 - a. Entering Assets with the Integration
 - b. Entering and Updating Assets
 - c. Entering Capital Lease Assets
 - d. Tracking Insurance, Service, and Repairs
 - e. Adjusting and Transferring Assets
 - f. Retiring and Reinstating Assets
 - g. These represent the primary major Human Capital Management Processes:

11. CORE HR

- a. Positions Analysis
- b. Managing Positions
- c. Create a New Position
- d. Move a Position
- e. Reclassify a Position
- f. Combo Codes
- g. Creating a Combo Code
- h. Update Position's Combo Code
- i. Changing a Position's Department
- j. Agency Combo Code and Positions Query
- k. Department Budget Tables
- l. Updating Position Department & Budget Tables
- m. Inactive Positions
- n. Inactivating a Position
- o. Running a Position Management Report
- p. Hiring & Maintenance of Workforce
- q. Hire
- r. Rehire
- s. Change (Data-Position-Transfer-Promo-Demotion)
- t. EEO Role Activity
- u. Workforce Composition Report
- v. EEO-4 State / Local Govt Report
- w. Termination
- x. Termination Types
- y. Leaves
- z. Discipline
- aa. Drug Testing

12. TIME & LABOR

- a. Payroll
- b. Time Collection & Validation
- c. Maintain Employee Payroll Data
- d. Additional Pay
- e. Maintain Work Schedules
- f. Taxes
- g. Payroll Reports
- h. Payroll Register Report
- i. Payroll Summary Report
- j. Deduction Register
- k. Wage Progression Report
- l. Leave Balances Report
- m. ePay

13. BENEFITS

- a. Benefits add/change/drop
- b. Benefits cost analysis
- c. Benefits usage
- d. Billing

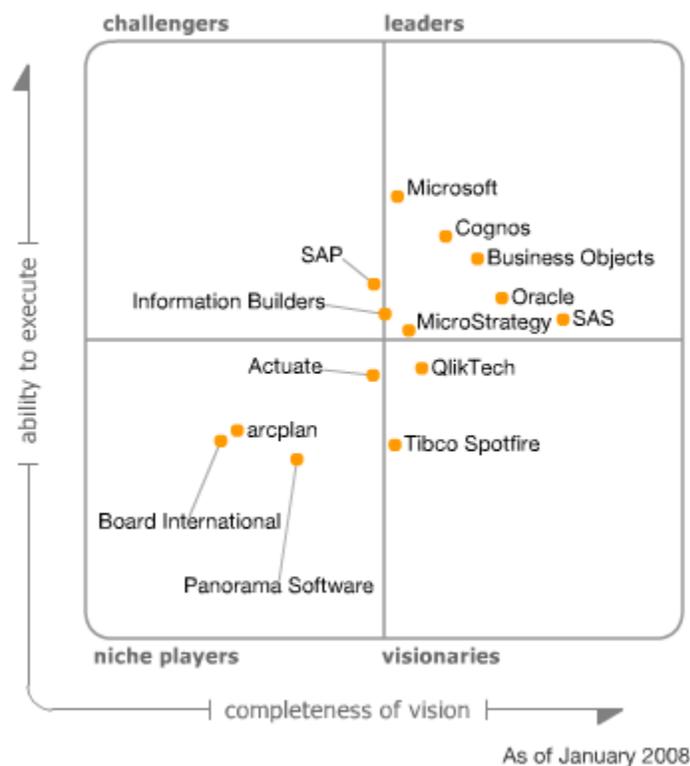
Implementation Alternatives Analysis

Cognos vs OBIEE

The initial position was that alternative BI tools should not be considered unless there was a compelling reason to do so. Two circumstances made it worthwhile to look at options.

1. According to the Cognos resources we were able to contact, it appears that Cognos has dropped support for its PeopleSoft EPM integration components (security and metadata)
2. Oracle has indicated that EPM will be much more tightly integrated with OBIEE in the future.

Addressing the tools themselves, both are considered to be leading product suites in the industry. Below is the Gartner magic quadrant showing their evaluation of various current tool suites.



Cognos (IBM) and Oracle are similarly rated as leaders. ICC experience with the tools OBIEE and Cognos supports the above rating in which OBIEE is slightly more visionary, excelling in its user friendliness and well integrated analysis capabilities, while Cognos is clearly the more mature offering. From a technical perspective, OBIEE offers caching capabilities well beyond what is available with Cognos. Smooth integration with the rest of Oracle's reporting tools, including those from Hyperion and from PeopleSoft are clearly still some time in the future (2009+). Cognos, recently acquired by IBM, is somewhat less clear about future directions, but at the same time also less confusing because Cognos is not faced with integrating a daunting array of somewhat overlapping products.

From the perspective of PeopleSoft EPM implementation, there is really little difference between the products. While having metadata pre-populated for OBIEE is nice, it is of

dubious use since the metadata is not specialized for the State of Ohio (or any other particular business environment). It would still be necessary to establish the correspondence between the field names and definitions from the Oracle world and those from state agencies.

OBIEE for EPM currently ships with a large number of sample reports that can be used as a starting point for customizing reports. Experience on using these templates is somewhat mixed, with some clients finding they can use the reports nearly as-is, giving them a significant leg up on development while other clients have reported that they found the templates almost useless and wasted a lot of time with them before simply writing their own reports. The key question is how well the delivered reports and data structures meet the needs of the business. Given the level of customization required by the state and the nature of some requirements, it is unlikely that the delivered reports would provide any reduction in implementation time (particularly since the approach we are recommending is incremental, not big bang. On the other hand, the existing reports (over one thousand so far) in Cognos do provide a good basis for understanding requirements and redeveloping them where necessary is significantly faster than starting completely from scratch.

Another factor to consider for the State of Ohio is the desire of agencies to be able to integrate data from OAKS with other state data. This would require additional licensing for OBIEE, but has already been addressed the Cognos enterprise license. Several agencies already have their own Cognos environments in addition to the centralized one the OAKS uses. This has resulted in a significant stable of report developers and users that have already scaled the learning curve for Cognos and would not be able to abandon it even if OAKS were to select a different tool. It is likely that forcing a change at this point would drive the level of dissatisfaction in the user community even higher. It is likely that larger organizations would simply abandon working with OAKS for business intelligence needs.

The table below is a numeric evaluation of Cognos and OBIEE based on the criteria listed. The weightings assigned are intended to reflect the discussion points mentioned above. In particular, User familiarity and developer availability weigh heavily because they are particular issues facing OAKS.

Criteria	Cognos	OBIEE	Cognos	OBIEE	
Knowledge of the tool within the user base	2	0	20%	0.4	0
Developer availability	3	2	10%	0.3	0.2
Internal Developer familiarity	2	0	10%	0.2	0
How well does the system integrate with our current system(s)	2	3	5%	0.1	0.15
How flexible is it	2	2	5%	0.1	0.1
Reporting capabilities we require	3	3	5%	0.15	0.15
Development ease	2	3	5%	0.1	0.15
Static reports	3	3	4%	0.12	0.12
Scheduling	3	3	4%	0.12	0.12
Graphing	3	3	4%	0.12	0.12
Cost	2	1	4%	0.08	0.04
Metadata capabilities/support	2	2	4%	0.08	0.08
Strength of company	3	3	4%	0.12	0.12
Quality of vendor support	2	2	4%	0.08	0.08
Responsiveness of vendor	2	2	4%	0.08	0.08
Integration with Excel	2	2	4%	0.08	0.08
Integration with security	2	0	4%	0.08	0
			1.00	2.31	1.59

It should be noted though that the largest share of time in developing reports and dashboards is spent gathering requirements and resolving data issues. Building the reports themselves in a modern reporting tool is generally quite fast except for the most elaborate reports.

Our recommendation is that OAKs should continue using Cognos for the foreseeable future.

Custom Data Warehouse vs EPM vs ORW

Another set of alternatives that the assessment team had to evaluate was the overall approach to building a multi-dimensional data warehouse. The alternatives that were evaluated were:

1. **Customized Incremental EPM Based Warehouse**
Customize the EPM data models and provided ETL as needed to implement the custom business functionality that agencies need. This approach differs from many EPM implementation in that it is incremental rather than all at once. The philosophy is also different because design still starts with the business requirements and merely attempts to use as many of the PeopleSoft provided components as possible.
2. **Custom Data Warehouse**
Define a warehouse from business requirements and define the minimum number of transformations and artifacts required to implement it. Arguably, this approach could have the fastest implementation time.
3. **Continue to evolve the ORW**
It would be possible to evolve the structures in the ORW with a combination of redesign tables, views and advanced database techniques to improve ease of use and deliver reasonable performance.

Based on our initial evaluation of requirements, it appeared that a custom data warehouse was probably the best alternative (least effort). Further consideration of what the state could do with its business intelligence capabilities beyond what is currently being asked suggested that the broad coverage of the PeopleSoft EPM MDW might be a compelling alternative. The fact that the business functionality provided **overlaps** significantly what would be required to meet the business needs articulated in our interviews could reduce the skill level required for implementation and accelerate development of functionality beyond what was initially requested.

Evolving the ORW was considered several times, but seemed in general to be the worst of all possible approaches. Whatever was done would disrupt current use, it would require a complex approach involving materialized views and sophisticated database tuning to achieve reasonable performance. The end result would be very difficult to maintain compared to a ground up dimensional model.

Below is a grid showing numerical ratings based on the factors shown on the left. We believe that the key to rapid delivery is using iterative requirements based design with full user participation during the development cycle. None of these approaches is really a magic bullet.

Criteria	Cust. EPM	Custom	ORW	Weighting	Cust. EPM	Custom	ORW
Integration with PeopleSoft	3	2	1	15%	0.45	0.3	0.15
How difficult is it to maintain	3	2	1	15%	0.45	0.3	0.15
Fit to State's requirements	3	3	1	15%	0.45	0.45	0.15
Usability	2	3	1	15%	0.3	0.45	0.15
Partially Prebuilt ETL	2	0	1	15%	0.3	0	0.15
Performance	3	3	1	15%	0.45	0.45	0.15
Responsiveness of vendor				10%	0	0	0
				100%	2.40	1.95	0.90

Our recommendation is that a customized EPM MDW be implemented using rapid, requirements focused development techniques. Models would be based on the PeopleSoft MDW as much as possible and use as much as possible of the supplied ETL. Of key importance, the dimensions would be conformed to those provided by PeopleSoft

so that it will be relatively easy to integrate any “out of the box” functionality that the state is able to use. A subject area based analysis of a subset of reports discussed in the interviews is included in the appendices of this document.

Oracle vs Netezza

Because of the enormous advantages of database appliances like Netezza in terms of price/performance, the assessment team also considered implementing an OAKS data warehouse on a different platform. The key advantage to switching to Netezza would be that achieving exceptional performance for the volumes of data the State of Ohio is considering would be quite easy. The requirement of having one or two DBAs familiar with Netezza would be a significant downside from the point of view of staffing. As can be seen from the chart below, Netezza winds hands down for a lot of criteria, but the need for additional specialized DBA skills when PeopleSoft will still be requiring skilled Oracle DBAs is a big factor in favor of staying with Oracle. We believe that Oracle can easily meet the performance needs of the OAKS EPM implementation if the database is designed properly and if Oracle performance enhancing features are applied appropriately.

Criteria	Oracle	Netezza	Weighting	Oracle	Netezza
Performance	1	3	30%	0.3	0.9
Ease of Management	2	3	20%	0.4	0.6
Cost	2	3	10%	0.2	0.3
Uses Available Expertise	3	0	35%	1.05	0
Reliability	3	3	5%	0.15	0.15
			100%	2.1	1.95

Our recommendation is to remain with Oracle until the data enough of the data warehouse has been properly implemented to do a reasonable performance evaluation.

Descriptions of Recommended Tools

Existing Reports by Subject Area from Interviews

Report Name	A/R	A/P	GL	Vouchers	Grants	Expenses	Funds	Assets	Cash	Budgets	HR
Adjustment Report					■						
Aging Detail Report	■										
Allotments Report		■									
Asset List Report						■	■	■			
Benefits Deceased Employees Exempt											■
Budget Balance Report				■							
Budget Ledger Agency Tracking										■	
Budget Status ALI Report										■	
Budget Status Report										■	
Budget Usage Analysis										■	
Canceled Warrant/EFT Report with Coding		■							■		
Canceled Warrant/EFT Report with Coding		■							■		
Cash Activity by Fund									■		

Report Name	A/R	A/P	GL	Vouchers	Grants	Expenses	Funds	Assets	Cash	Budgets	HR
Expenses Including non-posted - Journal Transactions					■						
Facilities Development										■	
Filled Vacancy Position Report											■
FMLA List Report											■
Fund Payment Activity Report				■							
General Ledger Balance			■								
General Ledger Balance Report by Department Id			■								
General Payment Coding Verification										■	
GL Journal to Voucher Accounting (Vouchers) by RCF			■								
GL Posted Expenses - Journal Transactions										■	
Grant Disbursement Report											
Grant Expenditures Report				■							
Grants History				■							
HCM Totals by Deduction Code											■
Intra-agency Transfers Report					■						
JFS MBE/EDGE Payment summary					■						
Journal ID Details			■								
Leave Balances with Usage/Accrual											■
Lifetime Grant Report				■							
Listing of Vouchers for County Advances					■						
MBE Vouchers Report List				■							
Military Leave Report											■
Misc Cash Deposits									■		
Miscellaneous Deposit Report									■		
Monthly Budget Summary by Fund										■	
Monthly Cash Disbursements									■		
Monthly Deposits_Direct Journal	■										
Monthly Deposits_Receivable Items	■										
New Hire Report											■
OAKS Voucher Drill Down		■									
Open Encumbrance Report		■									
Open Receivables by Customer	■										
Out-of-state Travel Expenses					■						
Out-of-state Travel Pending Requisitions					■						
Overtime Exempt Positions Verification Report											■
Overtime Report										■	
Paid Voucher Lookup					■						
Payment Card Payment Coding Verification										■	
Payment Detail by Invoice Number					■						
Payment Report By Vendor Id					■						

Report Name	A/R	A/P	GL	Vouchers	Grants	Expenses	Funds	Assets	Cash	Budgets	HR
Payment Report Sorted By Vendor Id and Department Id		■									
Payments by Fund Code					■						
Payments Detail by Voucher Origin				■							
Payroll Audit Report											■
Payroll Disbursements Journal											■
Payroll Expense Summary by Program Code					■						
Payroll HCM									■		
Payroll HCM – ALI									■		
Payroll Journal by Fund											
Payroll Journal Coding Verification										■	
Payroll Ledger Balance Coding Verification										■	
Payroll Projection											
Payroll Recap											■
Payroll Recapitulation by Depart ID										■	
Pending Approval Vouchers more than 30 days				■							
Personal Services Contract Payments					■						
PO Activity Report		■									
PO Balance Report		■									
PO Monitoring Report					■						
PT Employee Hours Worked											■
Refunds from the AR Payments Tables									■		
Refunds from the OAKS Receivables Item Information Reporting									■		
Requisitions by Department		■									
Retention Report Multiple Jobcodes											■
Revenue from the OAKS (General) Ledger Balance Reporting Table			■								
Revenue Transactions by Deposit ID	■										
Single Payment Vouchers				■							
Statewide Mail Expense					■						
Summary Expenditures by Account Id					■						
Summary Expenditures by Appropriation Line Item					■						
Summary Expenditures by Appropriation Line Item by Program Code					■						
Summary Expenditures by Department Id					■						
Summary Expenditures by Fund Code					■						
Summary Expenditures By Grant Id					■						
Summary Expenditures By Report Id					■						
Summary of Expenses by Object / Sub Object Code					■						
Summary of Expenses by Object Code					■						

Report Name	A/R	A/P	GL	Vouchers	Grants	Expenses	Funds	Assets	Cash	Budgets	HR
Summary of Paid Travel Vouchers											
Surplus Payment Detail											
Temporary Work Level Report											
Travel Mileage Payments											
Travel Payment Coding Verification											
Validation for Cash Draw											
Vendor Lookup											
Vendor Spending Report											
Vendor Spending Top 20 Report											
Vendor Summary Report											
Voided Payment Journal List											
Voucher Activity											
Vouchers by Department											
Voucher by Vendor											
Voucher Information											
Voucher Reconciliation											
Voucher Report with Warrant Information											
Warrant Listing by Date											
Years of Service											

PeopleSoft EPM Subject Area Analysis

Functional Area & Facts		
FIN	Accounts Payable	
		Voucher Management
		Vendor Payments
		AP Trial Balance
		AP Outstanding Amount
		Late Charge Amount
		Late Charge Denied Amount
		Gross Paid Amount
	Accounts Receivable	
		Customer Invoice
		Customer Receipts
		Revenue Recognition
		AR Outstanding Amount
FIN	General Ledger	
		Ledger Balances
		Approved Budget Amount

		Journal Amount
		Profit & Loss
		Balance Sheet
HR	Human resources	Compensation
		Deductions
		Flexible Spending Contribution
		Benefit Plan
		Employee reviews
		Appraisal Preliminary Review
		Leave Balance Analysis
		Case History Fact
		Case Survey Fact
		Job Code Cost Rate
		Job Code Bill Rate

Existing ORW Tables

HCM Operational Reporting Warehouse Tables			
Table	Description	Notes	Examples
Employee Information Reporting Table	The Employee Information Reporting data package hold personal information about the employee, as specific information about the employee's current job(s) within the State of Ohio.	<ul style="list-style-type: none"> • Approx. 200 fields • Effective dated 	<ul style="list-style-type: none"> · Employee Name · Hire Date · Annual Rate · Address
Health & Life Insurance Reporting Table	The Health & Life Insurance Reporting data package holds personal information about the employee's health benefits coverage.	<ul style="list-style-type: none"> • Approx. 45 fields • Effective dated 	<ul style="list-style-type: none"> · Employee Name · Plan Type · Coverage Begin Date · Coverage End Date
Leave Accrual Reporting Table	The Leave Accrual reporting data package holds information about the employee's leave accrual, benefit plan type and program. It also holds the number of hours taken, unprocessed and earned.	<ul style="list-style-type: none"> • Approx. 45 fields • Non-effective dated 	<ul style="list-style-type: none"> · Company · Plan Type · Hours of Service · Coverage Election
Leave Plan Reporting Table	The Leave Plan reporting data package holds information about the employee's benefits plan type and program, as well as the leave balance and carryover.	<ul style="list-style-type: none"> • Approx. 30 fields • Effective dated 	<ul style="list-style-type: none"> · Coverage Plan · Coverage Election · Pay at Termination · Position Number ·
Dependent Data Reporting Table	The Dependent Data reporting data package holds personal information about the employee's dependents, if they have any.	<ul style="list-style-type: none"> • Approx. 35 fields • Effective dated 	<ul style="list-style-type: none"> Dependent/Beneficiary Name · Benefit Program · Dependent's Date of Birth · Relationship to Employee
Benefit Billing Reporting Table	The Benefit Billing reporting data package holds personal information about the employee's benefit billing, such as status, reason, etc.	<ul style="list-style-type: none"> • Approx. 15 fields • Effective dated 	<ul style="list-style-type: none"> · Plan Type · Billing Status · Rate Percent · Rate Amount
Billing Activity Reporting Table	The Billing Activity reporting data package holds personal information about the employee's benefit activity, such as charges, adjustments, postings, payments, etc.	<ul style="list-style-type: none"> • Approx. 45 fields • Effective dated 	<ul style="list-style-type: none"> · Employee Name · Charge Amount · Charge Adjustments · Plan Type

Time & Labor Employee Information Reporting Table	The Time & Labor Employee Information reporting data package holds information affecting the employee's time reporting capabilities.	<ul style="list-style-type: none"> • Approx. 40 fields • Effective dated 	<ul style="list-style-type: none"> • Name • Position Number • Time Reporter Type • Holiday Schedule • Bargaining Unit • Scheduled Hours • Estimated Gross • Task Group • Incident Type • Claim Number • Union Code • Claim Status • Employee ID • Pay Period • FMLA Hours Paid this Period • Employee ID • Pay Group • Employee Class • Salary Grade • Pay Group • Position Number • Union Code • Fund Code • Earnings Code • Department Identifier • Account • Fund Code • Paycheck Name • Jobcode • Salary Grade • Project Identifier • Position Number • Business Unit • Maximum Head Count • Standard Work Period • Position Number • Appointment Type • Bargaining Unit Flag • Certification Status • Employee Identifier • Pay Group • Company • Paycheck Number • Longevity Service Date • Prior State Service Years • Jobcode • Bargaining Unit • Company • Deduction Code • Payment Method
Time & Labor Payable Time Reporting Table	The Time & Labor Payable Time reporting data package holds a record of all time reported for an employee by date.	<ul style="list-style-type: none"> • Approx. 70 fields • Effective dated 	
Health & Safety Information Reporting Table	The Health & Safety Information reporting data package holds information relating to incident and injury data, as well as the resulting workers compensation information for the employee.	<ul style="list-style-type: none"> • Approx. 40 fields • Effective dated 	
FMLA Eligibility Reporting Table	The FMLA Eligibility reporting data package holds combined HR2K and OAKS FMLA usage information.	<ul style="list-style-type: none"> • Approx. 6 fields • Effective dated 	
Employee Master Interface Reporting Table	The Employee Master Outbound Interface reporting data package holds information for employee payroll, benefits enrollment, compensation rates, and leave information for the employees in the agency.	<ul style="list-style-type: none"> • Approx. 920 fields • Effective dated 	
Objects of Expense Outbound Interface Deductions Reporting Table	The Objects of Expense Outbound Interface Deductions reporting data package defines the layout of deduction table interface records.	<ul style="list-style-type: none"> • Approx. 40 fields • Effective dated 	
Objects of Expense Outbound Interface Earnings Reporting Table	The Objects of Expense Outbound Interface Earnings reporting data package defines the layout of earning type interface records.	<ul style="list-style-type: none"> • Approx. 40 fields • Effective dated 	
Objects of Expense Outbound Interface Taxes Reporting Table	The Objects of Expense Outbound Interface Taxes reporting data package defines the layout of tax type interface records.	<ul style="list-style-type: none"> • Approx. 40 fields • Effective dated 	
Position Control Outbound Interface Reporting Table	The OAKS Position Control Outbound Interface reporting data package provides reporting capability for position specific information, information to determine an employee's total rate of pay, the most recent personnel action information, and budgeting information.	<ul style="list-style-type: none"> • Approx. 510 fields • Effective dated 	
Position Attributes Reporting Table	The Position Attributes Reporting data package holds custom position attributes about the employee as it applies to a position number within the State of Ohio.	<ul style="list-style-type: none"> • Approx. 15 fields • Effective dated 	
Paycheck Messages Reporting Table	The Paycheck Messages reporting data package provides reporting capability to see paycheck messages from the HR department on employee's paycheck.	<ul style="list-style-type: none"> • Approx. 15 fields • Effective dated 	
Ohio Service Dates and Credits Reporting Table	The Ohio Service Dates and Credits reporting data package holds service information for all active employees.	<ul style="list-style-type: none"> • Approx. 85 fields • Effective dated 	
General Deduction Override Reporting Table	The General Deduction Override reporting data package defines the layout of general deduction data package records. It will provide data related to the employee's deduction set-up in the system.	<ul style="list-style-type: none"> • Approx. 35 fields • Effective dated 	

HCM EHOC Reporting Warehouse

Employee History (EHOC) Reporting	The EHOC reporting table combines employee history information from OAKS HCM and the HR Legacy data warehouse. It holds information such as	<ul style="list-style-type: none"> • Approx. 15 fields
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Table	name changes, a new salary step and changes to job code.	<ul style="list-style-type: none"> ● Effective dated ● Approx. 3 fields ● Not dated
Employee Names	The Employee Names reporting table contains a combined view of all names and Social Security Numbers from OAKS and the legacy Employee Master file. It also contains the Employee Identification Number from OAKS.	

HR Legacy Data**Warehouse**

Employee Benefit Dependents	The Employee Benefit Dependents reporting table includes information regarding the benefit dependents of employees from the legacy system, including information such as plan code and date of change.	<ul style="list-style-type: none"> ● Approx. 25 fields ● Effective dated ● Approx. 20 fields
Employee Benefits Subscriber	The Employee Benefits Subscriber Information reporting table includes information for all employees who were participants in the state benefits plan at the time of first OAKS HCM release. It holds data such as the plan status, plan type, enrollment date and termination date.	<ul style="list-style-type: none"> ● Effective dated ● Approx. 270 fields
Employee Earnings Detail	The Employee Earnings Detail reporting table contains detailed payroll information for employees prior to the first release of OAKS.	<ul style="list-style-type: none"> ● Non-effective dated ● Approx. 35 fields
Employee Earnings Summary	The Employee Earnings Summary reporting table includes a complete earnings history for all employees prior to the first OAKS release.	<ul style="list-style-type: none"> ● Non-effective dated ● Approx. 10 fields
Employee History	The Employee History reporting table contains information on employees, including names and the last type of change>	<ul style="list-style-type: none"> ● Non-effective dated ● Approx. 125 fields
Payroll Objects of Expense	The Payroll Objects of Expense table holds data associated with payroll deductions and irregular pay.	<ul style="list-style-type: none"> ● Non-effective dated ● Approx. 360 fields
Inactive Employees Payroll	The Inactive Employees Payroll reporting table contains detailed payroll information for employees who are no longer active employees of the State!	<ul style="list-style-type: none"> ● Non-effective dated ● Approx. 235 fields
Position Control Detail	The Position Control Detail reporting table includes information regarding employees and their current positions position.	<ul style="list-style-type: none"> ● Non-effective dated ● Approx. 440 fields
Employee Master	The Employee Master reporting table holds detailed information on employees, including information such as tax exemptions and action dates.	<ul style="list-style-type: none"> ● Non-effective dated ● Approx. 310 fields
HR2K Comp Time and FMLA Usage	The Compensatory Time & FMLA reporting table contains information about an employee's usage of FMLA time and compensatory time balance and time used.	<ul style="list-style-type: none"> ● Non-effective dated

Current Environment Summary

Platforms

Server Name	Configuration details
Database Server	PDB1 HP-UX 11.23, HP 1000MHz PA-RISC 64 bit, 8 CPU, 50 GB
	PDB2 HP-UX 11.23, HP 1000MHz PA-RISC 64 bit, 8 CPU, 32 GB
	PDB3 HP-UX 11.23, HP 1000MHz PA-RISC 64 bit, 8 CPU, 50 GB
	PDB4 HP-UX 11.23, HP 1000MHz PA-RISC 64 bit, 8 CPU, 57 GB
Application Server	PAPP1 Windows Server 2003, AMD Opteron Processor 850, 2.20 GHz, 5.83 GB RAM
	PAPP2 Windows Server 2003, AMD Opteron Processor 850, 2.20 GHz, 5.83 GB RAM
	PAPP3 Windows Server 2003, AMD Opteron Processor 850, 2.20 GHz, 11.8 GB RAM
	PAPP4 Windows Server 2003, AMD Opteron Processor 850, 2.20 GHz, 11.8 GB RAM
	PAPP5 Windows Server 2003, AMD Opteron Processor 875, 2.20 GHz, 11.8 GB RAM
	PAPP6 Windows Server 2003, AMD Opteron Processor 875, 2.20 GHz, 5.83 GB RAM
	PAPP7 Windows Server 2003, AMD Opteron Processor 875, 2.20 GHz, 5.83 GB RAM
	PAPP8 Windows Server 2003, AMD Opteron Processor 275, 2.20 GHz, 5.83 GB RAM
	PAPP9 Windows Server 2003, AMD Opteron Processor 275, 2.20 GHz, 5.83 GB RAM
	PAPP10 Windows Server 2003, AMD Opteron Processor 275, 2.20 GHz, 3.83 GB RAM
	PAPP11 Windows Server 2003, Dual-Core AMD Opteron Processor 2222, 3.00GHz, 6.00GB RAM
	PAPP12 Windows Server 2003, Dual-Core AMD Opteron Processor 2222, 3.00GHz, 6.00GB RAM
	PAPP13 Windows Server 2003, Dual-Core AMD Opteron Processor 2222, 3.00GHz, 6.00GB RAM
	PAPP14 Windows Server 2003, Dual-Core AMD Opteron Processor 2222, 3.00GHz, 6.00GB RAM
	PAPP15 Windows Server 2003, Dual-Core AMD Opteron Processor 2222, 3.00GHz, 6.00GB RAM
	PAPP16 Windows Server 2003, Dual-Core AMD Opteron Processor 2222, 3.00GHz, 6.00GB RAM
Web Server	PWEB3 Windows Server 2003, AMD Opteron Processor 275, 2.21 GHz, 3.83 GB RAM
	PWEB4 Windows Server 2003, AMD Opteron Processor 275, 2.21 GHz, 3.83 GB RAM
	PWEB5 Windows Server 2003, AMD Opteron Processor 275, 2.21 GHz, 3.83 GB RAM
	PWEB7 Windows Server 2003, AMD Opteron Processor 275, 2.21 GHz, 3.83 GB RAM
Data Stage (ETL) Server	PDB1 HP-UX 11.23, HP 1000MHz PA-RISC 64 bit, 8 CPU, 50 GB
	PDB2 HP-UX 11.23, HP 1000MHz PA-RISC 64 bit, 8 CPU, 32 GB
	PDB3 HP-UX 11.23, HP 1000MHz PA-RISC 64 bit, 8 CPU, 50 GB
	PDB4 HP-UX 11.23, HP 1000MHz PA-RISC 64 bit, 8 CPU, 57 GB
Congos Server	ESSPRODCOGAPP1 Unknown
	ESSPRODCOGAPP2 Unknown
	ESSPRODCOGAPP3 Unknown
	ESSPRODCOGAPP4 Unknown
	ESSPRODCOGAPP5 Unknown

Storage

Psanapp I (EVA Storage)
Total Psanapp I Array space and usage:

HSV Storage System Network Properties	
Name:	HSV Storage System Network
Total HSV systems:	2
Total storage space:	65287.33 GB
Storage space used:	34241.11 GB
Available storage space:	31046.22 GB

OAKS - Ohio Administrative Knowledge System - PROD

OAKS_ARRAY1

Storage Capacity	
Total:	36869.68 GB

Used:	10171.98 GB
Available:	26697.70 GB

DATABASES(RMAN)
RMAN_CAT_DAT1

Capacity	
Requested:	<input type="text" value="10"/> GB
Allocated:	10 GB

RMAN_CAT_DAT2

Capacity	
Requested:	<input type="text" value="10"/> GB
Allocated:	10 GB

RMAN_CAT_LOG1

Capacity	
Requested:	<input type="text" value="5"/> GB
Allocated:	5 GB

RMAN_CAT_LOG2

Capacity	
Requested:	<input type="text" value="5"/> GB
Allocated:	5 GB

DBMONITOR
DL585_SAN

Capacity	
Requested:	<input type="text" value="10"/> GB
Allocated:	10 GB

DB-PROD-FIN
FIN_STG_DATA_RAW_0

Capacity	
Requested:	<input type="text" value="33"/> GB
Allocated:	33 GB

FIN-STG-DATA-RAW1

Capacity	
Requested:	<input type="text" value="33"/> GB
Allocated:	33 GB

DB-STG-RAW2

Capacity	
Requested:	<input type="text" value="33"/> GB
Allocated:	33 GB

DB-STG-RAW3

Capacity	
Requested:	<input type="text" value="100"/> GB
Allocated:	100 GB

DB-STG-RAW4

Capacity	
Requested:	<input type="text" value="310"/> GB
Allocated:	310 GB

DB-STG-RAW5

Capacity	
Requested:	<input type="text" value="241"/> GB
Allocated:	241 GB

STG-LOG-RAW0

Capacity	
Requested:	<input type="text" value="10"/> GB
Allocated:	10 GB

STG-LOG-RAW1

Capacity	
Requested:	<input type="text" value="10"/> GB
Allocated:	10 GB

**DB_PRD_PSPM-_P_Q
PSPM_DATA0**

Capacity	
Requested:	<input type="text" value="200"/> GB
Allocated:	200 GB

**DB-QAS-EPM
EPM PRFT DAT0**

Capacity	
Requested:	<input type="text" value="25"/> GB
Allocated:	25 GB

EPM PRFT LOG0

Capacity	
Requested:	<input type="text" value="5"/> GB
Allocated:	5 GB

QAS EPM PRF DATA 0 RAW

Capacity	
Requested:	<input type="text" value="500"/> GB
Allocated:	500 GB

QAS EPM PRF DATA LOG RAW 0

Capacity	
Requested:	<input type="text" value="20"/> GB
Allocated:	20 GB

QAS EPM QAS DATA RAW 0

Capacity	
Requested:	<input type="text" value="500"/> GB
Allocated:	500 GB

QAS_EPM_QAS_DATA_RAW_I

Capacity	
Requested:	<input type="text" value="500"/> GB
Allocated:	500 GB

QAS_EPM_QAS_LOG_RAW_0

Capacity	
Requested:	20 GB
Allocated:	20 GB

QAS_FIN_INT_DAT_0

Capacity	
Requested:	32 GB
Allocated:	32 GB

QAS_FIN_INT_DAT_1

Capacity	
Requested:	32 GB
Allocated:	32 GB

QAS_FIN_INT_DAT_2

Capacity	
Requested:	200 GB
Allocated:	200 GB

QAS_FIN_INT_DAT_3

Capacity	
Requested:	236 GB
Allocated:	236 GB

QAS_FIN_INT_LOG_0

Capacity	
Requested:	8 GB
Allocated:	8 GB

QAS_FIN_INT_LOG_1

Capacity	
Requested:	15 GB
Allocated:	15 GB

QAS_FIN_P2F_DATA_RAW_0

Capacity	
Requested:	750 GB
Allocated:	750 GB

QAS_FIN_P2F_LOG_RAW_0

Capacity	
Requested:	20 GB
Allocated:	20 GB

QAS_FIN_PRF_DATA_RAW_0

Capacity	
Requested:	650 GB
Allocated:	650 GB

QAS_FIN_PRF_LOG_RAW_0

Capacity	
Requested:	20 GB
Allocated:	20 GB

QAS_FIN_QAS_DATA_RAW_0

Capacity	
----------	--

Requested:	<input type="text" value="750"/>	GB
Allocated:	750 GB	

QAS_FIN_QAS_DATA_RAW_I

Capacity		
Requested:	<input type="text" value="250"/>	GB
Allocated:	250 GB	

QAS_FIN_QAS_LOG_RAW_0

Capacity		
Requested:	<input type="text" value="20"/>	GB
Allocated:	20 GB	

DB-QAS-HCM
QAS_HCM_ARC_DATA_RAW_I

Capacity		
Requested:	<input type="text" value="500"/>	GB
Allocated:	500 GB	

QAS_HCM_INT_DATA_RAW_0

Capacity		
Requested:	<input type="text" value="600"/>	GB
Allocated:	600 GB	

QAS_HCM_INT_LOG_RAW_I

Capacity		
Requested:	<input type="text" value="20"/>	GB
Allocated:	20 GB	

QAS_HCM_QAS_DATA_RAW_0

Capacity		
Requested:	<input type="text" value="700"/>	GB
Allocated:	700 GB	

QAS_HCM_QAS_DATA_RAW_I

Capacity		
Requested:	<input type="text" value="300"/>	GB
Allocated:	300 GB	

QAS_HCM_QAS_DATA_RAW_2

Capacity		
Requested:	<input type="text" value="1000"/>	GB
Allocated:	1000 GB	

QAS_HCM_QAS_LOG_RAW_I

Capacity		
Requested:	<input type="text" value="10"/>	GB
Allocated:	10 GB	

QAS_HCM_QAS_LOG_RAW_2

Capacity		
Requested:	<input type="text" value="20"/>	GB
Allocated:	20 GB	

DB QAS PRF
QAS_HCM_PRF_DATA_RAW_I

Capacity	
Requested:	<input type="text" value="500"/> GB
Allocated:	500 GB

QAS_HCM_PRF_DAT_0

Capacity	
Requested:	<input type="text" value="150"/> GB
Allocated:	150 GB

QAS_HCM_PRF_DAT_I

Capacity	
Requested:	<input type="text" value="150"/> GB
Allocated:	150 GB

QAS_HCM_PRF_LOG_0

Capacity	
Requested:	<input type="text" value="10"/> GB
Allocated:	10 GB

QAS_HCM_PRF_LOG_I

Capacity	
Requested:	<input type="text" value="10"/> GB
Allocated:	10 GB

QAS_HCM_PRF_LOG_RAW_I

Capacity	
Requested:	<input type="text" value="20"/> GB
Allocated:	20 GB

PRD_CRS
PROD_OCR

Capacity	
Requested:	<input type="text" value="1"/> GB
Allocated:	1 GB

PROD_VOTE

Capacity	
Requested:	<input type="text" value="1"/> GB
Allocated:	1 GB

QAS_CRS
QAS_OCR

Capacity	
Requested:	<input type="text" value="1"/> GB
Allocated:	1 GB

QAS_VOTE

Capacity	
Requested:	<input type="text" value="1"/> GB
Allocated:	1 GB

UC4
UC4 PRD DAT I

Capacity	
Requested:	<input type="text" value="16"/> GB

Allocated:	16 GB
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UC4PRD DAT2

Capacity	
Requested:	16 GB
Allocated:	16 GB

UC4PRD LOG1

Capacity	
Requested:	4 GB
Allocated:	4 GB

UC4PRD LOG2

Capacity	
Requested:	4 GB
Allocated:	4 GB

UC4 QAS DAT1

Capacity	
Requested:	6 GB
Allocated:	6 GB

UC4QAS DAT2

Capacity	
Requested:	6 GB
Allocated:	6 GB

UC4 QAS DAT3

Capacity	
Requested:	3 GB
Allocated:	3 GB

UC4 QAS DAT4

Capacity	
Requested:	3 GB
Allocated:	3 GB

UC4 QAS DAT5

Capacity	
Requested:	3 GB
Allocated:	3 GB

UC4QAS DAT6

Capacity	
Requested:	3 GB
Allocated:	3 GB

UC4 QAS LOG1

Capacity	
Requested:	2 GB

Allocated:	2 GB
------------	------

UC4 QAS LOG2

Capacity	
Requested:	2 GB
Allocated:	2 GB

FILE SERVERS
PBACKUPI_APP_0

Capacity	
Requested:	25 GB
Allocated:	25 GB

PBACKUPI_APP-1

Capacity	
Requested:	25 GB
Allocated:	25 GB

PBACKUPI_APP_2

Capacity	
Requested:	25 GB
Allocated:	25 GB

PBACKUPI_APP_3

Capacity	
Requested:	25 GB
Allocated:	25 GB

PBACKUPI_IGNITE_1

Capacity	
Requested:	100 GB
Allocated:	100 GB

PBACKUP_IGNITE_2

Capacity	
Requested:	100 GB
Allocated:	100 GB

PBACKUP_REC_0

Capacity	
Requested:	50 GB
Allocated:	50 GB

PBACKUP_REC_1

Capacity	
Requested:	50 GB
Allocated:	50 GB

QDBI)IGNITE_1

Capacity	
Requested:	100 GB
Allocated:	100 GB

Tape_Conversion_psanapp1

Capacity	
Requested:	50 GB
Allocated:	50 GB

F-PRD
DBPRODUCTIONAPP_4

Capacity	
Requested:	75 GB
Allocated:	75 GB

DGPRODUCTIONAPP_0

Capacity	
Requested:	30 GB
Allocated:	30 GB

DGPRODUCTIONAPP_1

Capacity	
Requested:	30 GB
Allocated:	30 GB

DGPRODUCTIONAPP_2

Capacity	
Requested:	20 GB
Allocated:	20 GB

DGPRODUCTIONAPP_3

Capacity	
Requested:	20 GB
Allocated:	20 GB

DGPRODUCTIONFRA_0

Capacity	
Requested:	500 GB
Allocated:	500 GB

DGPRODUCTIONREC_1

Capacity	
Requested:	800 GB
Allocated:	800 GB

DGPRODUCTIONREC_2= 800gb
 DGPRODUCTIONREC_3=100gb

DGPRODUCTIONREC_4=100gb

ORA_DB_MISC_0=100gb
 ORA_DB_MISC_1=100gb

PFILE_ARCHIVE_DISK0=100gb
 PFILE_I_RPT_ARCH_DISK_0=300gb
 PFILE_F_SAN=10GB
 PFILE_P_SAN=10GB
 PFILE_R_SAN=300GB
 PFILE_S_SAN=50GB
 PRD_PFILE_Q_0=100GB
 PRD_CLUSTER_LOCK_DISK_0=1GB
 Etc-oracle-pdb1=5gb
 Etc-oracle-pdb2=5gb
 Etc-oracle-pdb3=5gb
 Etc-oracle-pdb4=5gb

DGQUALITYAPP_0=30gb
 DGQUALITYAPP_1=30gb
 DGQUALITYAPP_2=20gb
 DGQUALITYAPP_3=20gb

DGQUALITYAPP_4=50gb
 DGQUALITYAPP_5=50gb
 DGQUALITYAPP_6=50GB
 DGQUALITYfra_0=525GB
 DGQUALITYREC0=250GB
 DGQUALITYREC1=250GB
 DGQUALITYREC2=125GB
 DGQUALITYREC3=125GB
 DGQUALITYREC5=250GB
 DGQUALITYREC6=250gb
 DGQUALITYREC7=500gb
 DGQUALITYREC8=500gb
 QA_CLUSTER_LOCK_DISK_0=1gb
 QA_ORA_DB_MISC_0=100gb
 QA_ORA_DB_MISC_1=100gb
 QA_QFILE_R_SAN_1=80gb
 QFILE_F_SAN=10gb
 QFILE_P_SAN=5gb
 QFILE_Q_SAN_0=100gb
 QFILE_S_SAN=55gb
 etc-oracle-qdb1=5gb
 etc-oracle-qdb2=5gb
 etc-oracle-qdb3=5gb

OAKS_ARRAY 2

Storage Capacity	
Total:	36869.68 GB
Used:	10171.98 GB
Available:	26697.70 GB

Identification	
Name:	PROD_EPM_PRD_DATA_RAW_0

Capacity	
Requested:	650 GB
Allocated:	650

Name:	PROD_EPM_PRD_DATA_RAW_1
-------	-------------------------

Capacity	
Requested:	100 GB
Allocated:	100 GB

Name:	PROD_EPM_PRD_DATA_RAW_2
-------	-------------------------

Capacity	
Requested:	250 GB
Allocated:	250 GB

Name:	PROD_EPM_PRD_LOG_RAW_0
-------	------------------------

Capacity	
Requested:	20 GB
Allocated:	20 GB

Name:	QA_EPM_CFS_DATA_RAW_0
-------	-----------------------

Capacity	
Requested:	500 GB
Allocated:	500 GB

Name:	QA_EPM_CFS_DATA_RAW_1
Capacity	
Requested:	200 GB
Allocated:	200 GB

Name:	QA_EPM_CFS_LOG_RAW_0
Capacity	
Requested:	20 GB
Allocated:	20 GB

Name:	PROD_FIN_PRD_DATA_RAW_0
Capacity	
Requested:	750 GB
Allocated:	750 GB

Name:	PROD_FIN_PRD_DATA_RAW_1
Capacity	
Requested:	250 GB
Allocated:	250 GB

Name:	PROD_FIN_PRD_LOG_RAW_0
Capacity	
Requested:	20 GB
Allocated:	20 GB

Name:	QA_FIN_CFS_DATA_RAW_0
Capacity	
Requested:	500 GB
Allocated:	500 GB

Name:	QA_FIN_CFS_LOG_RAW_0
Capacity	
Requested:	20 GB
Allocated:	20 GB

Name:	PROD_HCM_ARC_DATA_RAW_0
Capacity	
Requested:	600 GB
Allocated:	600 GB

Name:	PROD_HCM_ARC_LOG_RAW_0
Capacity	
Requested:	10 GB

Allocated:	10 GB
Name:	PROD_HCM_PRD_DATA_RAW_0
Capacity	
Requested:	600 GB
Allocated:	600 GB
Name:	PROD_HCM_PRD_DATA_RAW_1
Capacity	
Requested:	250 GB
Allocated:	250 GB
Name:	PROD_HCM_PRD_LOG_RAW_0
Capacity	
Requested:	20 GB
Allocated:	20 GB
Name:	QA_FIN_INT_DATA_RAW_0
Capacity	
Requested:	300 GB
Allocated:	300 GB
Name:	QA_FIN_INT_DATA_RAW_1
Capacity	
Requested:	300 GB
Allocated:	300 GB
Name:	QA_FIN_INT_DATA_RAW_2
Capacity	
Requested:	300 GB
Allocated:	300 GB
Name:	QA_FIN_INT_LOG_RAW_0
Capacity	
Requested:	20 GB
Allocated:	20 GB
Name:	QA_FIN_CRP_DATA_RAW_0
Capacity	
Requested:	750 GB
Allocated:	750 GB
Name:	QA_FIN_CRP_LOG_RAW_0
Capacity	

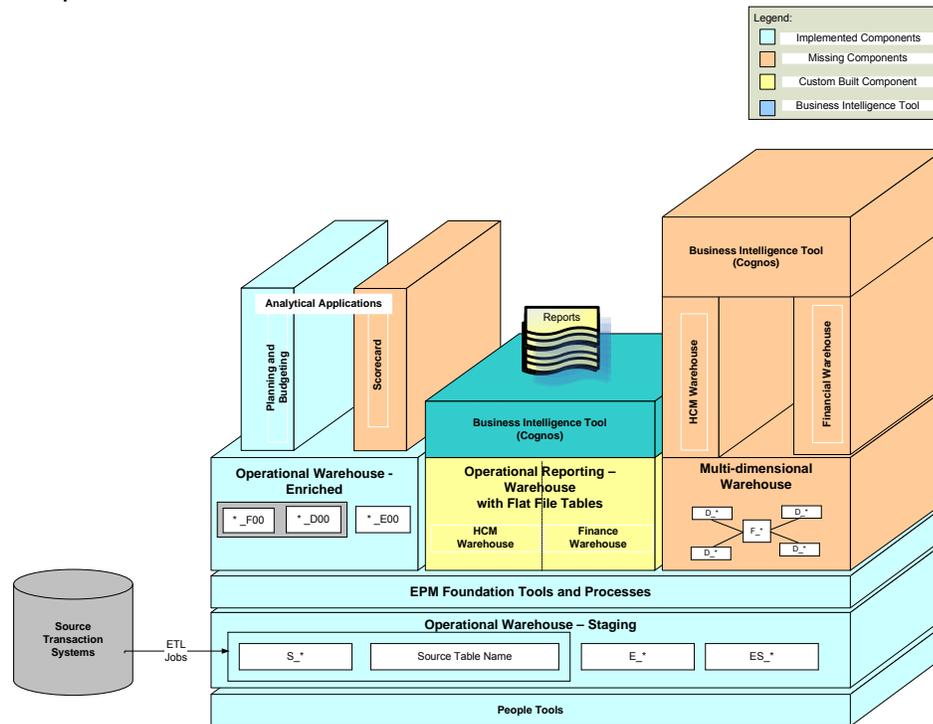
Requested:	20	GB
Allocated:	20 GB	
Name:	QA_FIN_SBX_DATA_RAW_0	
Capacity:		
Requested:	25	GB
Allocated:	25 GB	
Name:	QA_FIN_SBX_LOG_RAW_0	
Capacity:		
Requested:	5	GB
Allocated:	5 GB	
Name:	DGPRODUCTIONFRA_1	
Capacity:		
Requested:	250	GB
Allocated:	250 GB	
Name:	DGPRODUCTIONFRA_2	
Capacity:		
Requested:	250	GB
Allocated:	250 GB	
Name:	PROD_DEPOT_0	
Capacity:		
Requested:	20	GB
Allocated:	20 GB	

Software

	Software	Version
Database Server	Oracle Server 10g	10.2.x
Application Server	PeopleSoft HRMS	8.9
	PeopleSoft Finance	8.8
	PeopleSoft EPM	8.9
Extract Transform and Load tools	Ascential DataStage	7.5
Business Intelligence	Cognos	8.2

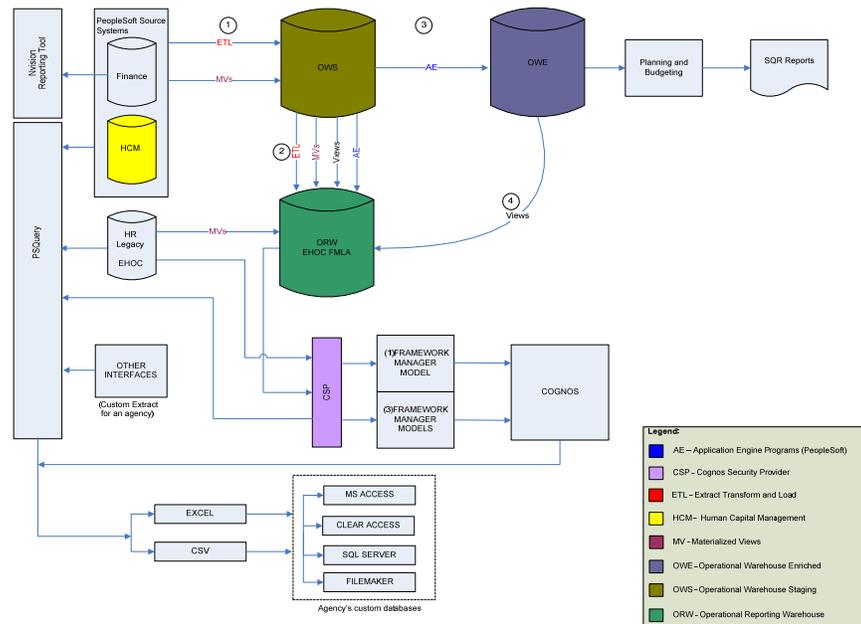
Conceptual Architecture

Based on a standard PeopleSoft diagram, the diagram below indicates the missing MDW components.



Data Flow and Interfaces

Data Flow



Data Stores

PeopleSoft Application Tables (FIN and HCM on the drawing above) are the tables used by the PeopleSoft applications directly. They can be queried using the components provided as part of People Tools.

Operational Warehouse Staging (OWS) is where data is replicated prior to being transformed. Most of the tables in it are images of PeopleSoft application tables.

Operational Warehouse Enriched (OWE) is an operational warehouse in which data is decoded and otherwise made more easily queried. It is populated from the OWS. The OWE also supports the PeopleSoft Planning and Budgeting application.

HR Legacy Data is a store of Employee data retained from the previous system. Some of this data is carried forward into the ORW and the rest can be queried directly using Cognos. There is a Framework Model for this data.

Operational Reporting Warehouse (ORW) is a warehouse for end user queries. It is populated from the OWS and from Legacy HR data. Cognos is used as the primary access method for reporting from the ORW data. This access is enabled/mediated through a number of Cognos Framework Models.

Note:

Within agencies there are numerous other data stores used to augment the reporting currently available. These include spreadsheets, access databases, SQL Server, DB2 and Oracle databases populated by either official or unofficial feeds extracted from various points in the data flow above.

Key Data Flows

PeopleSoft to OWS – A combination of DataStage Extract/Transform/Load (ETL) jobs and Materialized View refreshes that mostly replicate data from PeopleSoft operational tables.

OWS to OWE - A combination of DataStage ETL Jobs and Materialized View Refreshes that enrich the data as it is conveyed. This transformation is primarily reformatting, decoding and otherwise making the data easier to query.

OWS to ORW – A combination of DataStage ETL Jobs and Materialized View Refreshes that creates the Master File type table structures that end users eventually run reports against.

Legacy HR to ORW – Materialized Views allow current and historical HR data to be combined.

Interfaces

HCM Interface Inventory	
Interface Name	Interface Description
DDP001	Direct Deposit Transmittal file
OH_DDP001_FTP	Payroll Files to Huntington Bank
OH_DDP001_FTP_DELAYED	Payroll Files to Huntington Bank - Sent 20 minutes after first file is sent
OH_DDP001_FTP_MTHLY	Payroll Files to Huntington Bank
OH_DDP001_FTP_MTHLY_DELAYED	Payroll Files to Huntington Bank sent after 20 minutes
OH_HR35	Employee Certification (CERT) Interface
OH_IMPORT	Used for downloading files for SPRT tool
OH_INH01	INH01 Inbound Interface Load to Additional Pay Tables
OH_INH02	EPDP eligibility outbound interface
OH_INH03B	Standard General Deduction Inbound Interface
OH_INH04	This is an outbound interface that sends employee general deductions withheld for various insurance credit unions and loan payments not related to a Benefit plan.
OH_INH04A	Updated version of INH04 - Standard Deduction Outbound
OH_INH05	Employee Master
OH_INH06	Object Of Expense Outbound Interface

OH_INH07	Position Control Outbound Interface
OH_INH08	TCD Inbound Interface
OH_INH12	United Way Eligibility - Annual Combined Charitable Campaign - Outbound
OH_INH15	Bi-Weekly City Tax for Municipalities.
OH_INH19	Outbound Interface that sends Health Benefit Information NOT paid to Payroll Deductions to vendors
OH_INH20A	Benefits Trust Outbound interface
OH_INH20B	COLE VISION
OH_INH20C	Vision plan
OH_INH20D	REGULAR HEALTH INTERFACE
OH_INH20E	Delta Dental Outbound Interface
OH_INH20G	United Behavioral Health Outbound Interface
OH_INH22	UET Computer Purchase Plan
OH_INH24	WageWorks Eligibility Outbound Interface
OH_INH246	Ohio Department Budget Load
OH_INH25	FSA Eligibility Outbound Interface
OH_INH27B	Deferred Compensation Separations File
OH_INH28	HIPAA EDI 834 file
OH_INH29A	Inbound interface for drug test results
OH_INH30A	This is an outbound interface which generates a file containing PERS/LEERS information all of which is to be distributed to OPERS only.
OH_INH30B	Service Buy Back Outbound
OH_INH30C	STRS BiWeekly Outbound Interface
OH_INH30D	HERS Outbound Interface
OH_INH30F	STRS ANNUAL INTERFACE
OH_INH322	Account Code Load
OH_INH40	Outbound Leave Accruals Interface
OH_INH41	State Phone List
OH_INH50	This is an outbound interface for the OIT directory consolidation project
OH_INTF	This Interface def is used for testing
OH_KRONOS	Kronos Crosswalk Interface
OH_PY32	Load EFT Errors from Bank
OH_SWEEP_DOT_RECONCILIATION_FILES	Sweeps only DOT Files out of the Reconciliation Directory.
OH_SWEEP_RECONCILIATION_FILES_TO_STAGING	Sweeps all files that need to be reconciled to the proper staging directories.
OH_SWEEP_RECONCILIATION_FILES_TO_STAGING_05_07	Sweeps all files that need to be reconciled to the proper staging directories.
OH_SWEEP_RECONCILIATION_FILES_TO_STAGING_07_MTHLY	Sweeps all files that need to be reconciled to the proper staging directories.
OH_TINF01	This is an Inbound Interface file for Chartfield Mapping
OH_TINF02	Employee Payment Expense and Fringe Outbound Interface
OH_TINF03	HCM Vendor payment
OH_TINF05	Vendor data file to ROSCOE
PAY015A	Warrant Reconciliation
PAY016B	Savings Bond Federal Reserve

FINANCIALS Interface inventory	
Interface Name	Interface Description
AR25001	
FIN2025	Outbound EFT Pay cycles
FIN2025_FTP_UPLOAD_CHASE	Upload
FIN2025_FTP_UPLOAD_KEYBK	
FN2025_FTP_UPLOAD_KEY	
OHPO027	OHPO027

OH_AP052	Redeemed warrant file from TOS
OH_AP052_OUT	Output of OH_AP_7DIGIT program
OH_AP053	
OH_AP055	EFT Rejects
OH_AP072	OH_AP072
OH_ECIN0001	INF02 File Load Via ECIN0001
OH_ECIN2001	INF02 File Loading via ECIN2001
OH_ECINJFS06	
OH_ECINJFS2	
OH_ECINJFS3	
OH_ECINJFS4	
OH_ECINJFS6	
OH_ECINJFS7	
OH_ECINTAX2	
OH_EX002	Travel Expense Integration Interface
OH_INF01	Outbound Vendor data interface
OH_INF02	Single Payment vendors Interface
OH_INF03	Outbound Payment Data Interface
OH_INF04	Inbound EDI Interface
OH_INF04_EDI_OUT	OH_INF04_EDI_OUT
OH_INF09A	
OH_INF09A_MAF	Inbound MAF Processing
OH_INF09B	Inbound ACH Processing
OH_INF09B_ACH	Inbound ACH Processing
OH_INF15	Master Table Interface
OH_INF17	Inbound Encumbering Interface
OH_INF18	Outbound PO Interface
OH_INF22	Inbound Vendor Contract Interface
OH_INF23	ECB Waivers Inbound Interface
OH_INF25	Outbound Spending Items Interface
OH_INF28	Inbound Pending Item Interface
OH_INF29	ODOT P-Card Inbound Interface
OH_INF30	Inbound Billing Interface
OH_INF31	Customer Load
OH_INF32	P-Card Outbound Interface
OH_INF33	Print Warrant File Interface
OH_INF34	OH_INF34
OH_INF34_AE	This Inbound interface loads payments to be cancelled in OAKS.
OH_INF35	
OH_INF41	Inbound Budget Journal Flat File Import
OH_INF42	Inbound GL Journal Interface
OH_INF43	Outbound Speedchart Interface
OH_INF44	Inbound Speedchart Interface
OH_INF45	Outbound Ledger GL Interface
OH_INF46	Outbound Budget Journal Interface
OH_INF49	Inbound OIT Release and Permit

Security

EPM roles matrix:

Assessment Process

Interview Guide (sent to interviewees prior to interviewing)

Overview

The OAKS Enterprise Performance Management /Data Warehouse Assessment Team is tasked with providing a current state assessment, recommendations and a strategic pathway for the OAKS Enterprise Performance Management environment. A series of approximately twelve week development cycles will then be executed to enhance the functionality and usability of the EPM environment with minimal disruption to current usage. As part of this assessment process, the team will be interviewing people from an approximately 25% sample of the agencies and from various parts of the IT organization. An effort will be made to interview all three categories of reporting users (operational, management and strategic) whenever possible. The assessment will document a wide variety of viewpoints from many different stakeholders.

Purpose of Interview

Because the project is being done with a very compressed timeframe, each interview will have multiple objectives:

- to establish the role played by each individual interviewed and how they interact with the OAKS systems and organization
- to collect going forward information needs and determine their relative importance, particularly
 - operational reporting
 - management reporting
 - key performance indicators (KPIs) at various levels
 - data feeds to/from agency systems
- to capture concerns and issues with the current EPM environment (as well as noting its successful aspects!) whether functional, organizational or technical
- to document and prioritize the perceived functional gaps in the capabilities currently provided by the EPM environment
- to identify what if any steps are being taken to supplement the data, reports and development capabilities provided by OAKS
- to review key OAKS processes and how they are perceived by the people making use of them and by the people involved in them

The compiled results of the interviews and other data collected during the assessment will be made available to OAKS management as well as the recommendations derived from it.

Interview Process

I. Selection

Interviewees are being selected from the agencies using OAKS (FIN/HCM) applications and reporting at a variety of different levels with a variety of different roles to ensure a reasonable breadth of opinions and experience. The targeted areas are OAKS staff,

OAKS users and consumers of the information provided by OAKS. Members of the OAKS team are participating in selecting the people to be interviewed.

2. Notification and Scheduling

Designated staff will contact the prospective interviewees and schedule the interview. The assessment team will then send the interviewee a set of questions representative of what may be asked in the interview to allow for any required preparation. Among the materials an interviewee might wish to provide are examples of issues they have encountered sample reports or lists of data items that they have been unable to locate in the current EPM environment.

3. The interview itself will take approximately an hour and will cover different material depending on the role of the interviewee. The last section of this document contains an overview of the kinds of questions we will be asking. The interview itself will not be as structured as the questions might suggest, allowing for additional explanation as required. The assessment team will compile notes for each interview and ensure that the concerns of each interviewee are captured and communicated.

4. Within three business days of the interview, the notes will be compiled and circulated back to the interviewee(s) to give them a chance to add anything else that seems important and verify that the assessment team has properly captured their concerns and requirements.

5. Follow-up

Based on the interview, the assessment team may send additional questions or requests for documentation via-email. It is also likely that either in this phase or in a future phase, additional meetings to gather requirements will be required.

Interview Questions

This set of questions is aimed at EPM users. Support staff questions are much more individual. Please note that an interview is a conversation and not a questionnaire. Depending on what an interviewee says, the script for a particular interview may differ significantly from what is given below.

Establish Individual Role

- What is your area of responsibility?
- Do you directly use Cognos, PSQuery, SQR or other reporting tools? If so can you describe your usage?
- If you do use reporting tools, do you also create reports? Do you use the information you report on or do you collect it for others to use?
- Have you ever requested assistance from the OAKS team? Can you tell us about that interaction?
- Have you used any of the support materials like the data dictionaries provided by OAKS?
- Did you receive training in using Cognos? How effective do you think the training was?

Collect Information Needs

Because of its nature, this will vary widely depending on the level and role of the person being interviewed.

- Choose the subject areas in which your area has information needs and assign them a relative priority.
- For each, identify the key business processes that use that information use?
- What reports do you currently use?
- Are these processes currently supported by data from OAKS?
- How frequently does this data need to be refreshed?
- Are you mostly concerned with aggregate data or specific data?
- Do you need interactive analysis capabilities?
- Do you need statistical analysis capabilities?
- Do you need historical data?
- Do you need management by exception alert capabilities?
- Do you use schedule reports?

Capture Concerns & Issues (functional, organizational or technical)

- Have you experienced any issues with the quality of the data available in the OAKS EPM environment? Missing data that you would expect to have seen?
- Do you find Cognos reporting against OAKS data to be relatively easy to use? Are there aspects that you find frustrating or difficult?
- Has the OAKS organization been responsive to your reporting needs?
- Have you been successful in finding workable ways to get the information you need?
- How has performance been?
- How has availability been?
- Are you satisfied with the documentation you have available?
- Are you satisfied with the training that has been made available?

Document Functional Gaps

- Have you observed any particular missing capabilities or data when using OAKS?
- Can you prioritize those functional gaps?
 - (looking at the subject areas) Are there any key subject areas that your organization needs beyond those listed?
 - Has your organization built or requested any custom reports against OAKS data?
 - If so, can we get a list of them?
 - Are there other specific reports that you need and have not yet found or created?
 - Do you feel comfortable that you have a good understanding of what reports have been supplied by OAKS?

Identify Alternative Reporting (if any)

- Do you or your organization use internal reporting or data analysis tools other than those provided directly by OAKS?
- If so, can you describe how they are used?

Review Key OAKS Processes

- Can you describe your experience with the following OAKS processes?
 - Change Management
 - How do you know when something has changed?
 - How do you get something changed?
 - User Support
 - Technical Issues
 - Data Issues
 - Developer Support
 - Requesting Reports
 - Reporting Data Quality issues
 - Requesting report/data changes
 - Security

Interview Participants – Information removed

Name	Title	Level	Agency
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