King County

ABT PROGRAM

Accountable Business Transformation

ABT Program

Data Management Strategy and Plan

June, 2008

Revision History

Version	Prepared by	Date	Reviewed by	Approved by	Note
Original v.1	Bill Neuhardt-CIBER, Sujender Produturi - CIBER	May 27, 2008	Lisa Gauthier	Marjorie Mills	
v.2	L. Gauthier	June 30, 2008	ABT Team	Marjorie Mills, Keith Pace-CIBER	OCM requested changes,

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1.0 Introduction

1.1 Executive Summary

The primary goal of the ABT Program is to consolidate the functions of Human Capital Management (HCM) and Financials into a common platform. The approach will be by re-implementing PeopleSoft HCM Release 9.0 and Oracle E-Business Suite (EBS) Release 12 countywide and integrating the county's new budget system into this new environment.

This data management plan recognizes the need to treat information as a corporate asset by ensuring that it is properly managed, secured, and available. The data management plan provides a road map that includes archiving historical data, mapping data values for new system, conversion approach, process, tools and team roles and responsibilities. The plan also addresses the need to further examine on-going data archiving tools for future uses across system performance, business data storage and retrieval, and with data and information retention requirements.

1.2 Objectives:

The objective is to provide a comprehensive data management plan that covers all aspects of managing data. The first section lays out the data migration strategy by providing a blue print for migrating data from legacy systems. The second section focuses on the on-going data management and lays out the steps that need to be taken for managing data, maintaining data integrity and data quality. The third and last section provides an archiving plan for the ABT Program. The high level objectives of the data management plan are to:

- Enable data storage and retrieval in the new production systems by describing the data that will be converted into the new systems.
- Ensure data integrity and data quality.
- Provide a data archival plan for system performance and historical reporting.

These objectives are broken down and addressed in detail in the document.

1.3 Data Management Strategy:

Data Management Strategy for Year 1-3

Data Migration: The data migration strategy is to provide a blueprint of the activities and approach that the Implementation Team would take in order to accomplish migration of data from various source systems to the Oracle EBS and PeopleSoft HCM modules. These activities will start at project initiation for the major known data conversions based on detail implementation planning. However, the fit/gap process may identify new data migration requirements that will need to be included. Conversion specifications and mapping validation will be performed before the conversion programming begins.

This document addresses various areas of the data migration process which impact the project timelines, thus determining the success of this implementation phase.

1. Data Migration Scope
2. Data Migration Approach
3. Migration Tools
4. Communication and Coordination

On-Going Data Management: Data integrity and data quality are on-going issues that need to be addressed. Organizations should have the ability to analyze, improve and control their data, thereby enhancing the quality of data. This document recognizes the need for on-going data management and recommends the approach that needs to be taken.

Data Archiving: Data Archiving is a function of managing data growth via intelligent archiving. Data can grow exponentially. This document recommends how data should be archived and the best practices around data archiving.

Data Management Strategy for Year 4-5

With the ABT Program's re- implementation of PeopleSoft HCM 9.0 and Oracle EBS 12, this will become the foundation for the county's data archiving strategy. There will be other business drivers which will become refined with use of the new tools suite and reporting solutions, and improve the current understanding the electronic data archive and retention business requirements which are circulated in draft currently. New hardware and software performance will play a key role in determining performance archiving parameters for data purging. Defining and implementing a long-term archiving strategy is planned after implementation and stabilization has occurred. The process steps are listed below:

Initiate Long Term Archive Management Requirements and Tool Selection Effort

- Establish a statement of need (Business Case and Cost Benefit Analysis) based on the PeopleSoft and Oracle implementation.
- Formally document business and technical requirements.
- Conduct a review of existing archive solutions (modules/infrastructure architecture) as sole source option, including a proof of concept if viable.
- Establish a milestone decision on recommendations for a PeopleSoft/Oracle solution or with an outside vendor or service solution
- If not a PeopleSoft or Oracle solution:
    - Prepare a request for proposal (RFP) based on requirements gathered
    - Evaluate vendor responses
    - Approve contract

Solution Implementation (not included in Year 4-5)

Repeat the process as needed due to this being a multi-phased approach (not included in Year 4-5)

The county must first identify target areas of need where growth has impacted system performance and therefore plan the archive of that body of data, design, test and implement. Then move to the next area of need and repeat the process as this is not a single archival implementation.

1.4 Summary of Recommendations for Years 1-3:

- **Migration of Data**
  - The county currently uses Oracle IBIS, which is an Oracle Applications Release 11.5.10. The ABT Program will re-implement Oracle with Oracle E-Business Suite (EBS) Release 12 along with incorporating certain additional modules within Oracle EBS suite.
    - Only open transactions and current balance or monthly balances will be migrated to Oracle EBS.
    - Configuration data will be migrated to Oracle EBS such as Vendor and Item Masters
    - Historical data will not be migrated to Oracle EBS
  - PeopleSoft HCM 8.9 will be re-implemented using PeopleSoft HCM 9.0 and adding Position Management functionality.
    - Most data will be migrated except where performance issues exist, and there is agreement to purge.
      - Time and Labor data from years 2004 thru 2008 will be sent to the HARC Archive Database after being upgraded with any release 9.0 schema changes.
      - Benefit Participation (BAS_PARTIC) transactions older than November 2006 will be dropped.
  - Decommissioning Systems: Data from core legacy systems that are recommended for retirement (IBIS, ARMS, AIRS, BUS,PFM, IVIS, TRH, MSA and POL):
    - Historical data will not be migrated to the new systems
    - Only accounting and payroll balances will be migrated
    - Only open transactions will be migrated (purchase orders (PO), invoices, deductions, etc.)
    - The remaining human resource (HR) data in MSA will be migrated to PeopleSoft HCM.

- **Data Migration Tools:**
  - Oracle EBS Data Migration toolset
    - The below combination of data migration tools are recommended for migrating data to Oracle EBS modules. These tools are free and come at no additional licensing cost.
      - Programmatic migration (SQL Loader / SQL / PLSQL / APIs)
      - Data Loader
      - Application Desktop Integrator (ADI)
  - PeopleSoft Data Migration toolset
    - The below combination of data migration tools are recommended for migrating data to PeopleSoft Modules. These tools are free and come at no additional licensing cost.
      - Application Engine (AE)

- Component Interface (CI)

Data Migration Approach:

The recommended data migration approach for the ABT Program is to build *custom programs* that use a combination of tools provided by Oracle EBS and PeopleSoft HCM modules. The approach outlines building the data migration process that covers the following aspects of data migrations.

- Data Preparation
- Data Extract
- Data Transformation
- Data Load
- Monitoring and Control
- Mock Conversion
- Handling Sensitive Data
- Approvals
- Roles and Responsibilities

- **Data Management Tools:**

  Several Data Management Tools exist in the market place that provide comprehensive data management and address data profiling, data transformation, data merging and data formatting.

  Oracle EBS and PeopleSoft HCM provide several methods by which data can be managed. As such, additional data management tools are not recommended. Data integrity and data quality can be maintained using a combination of the below.

  - Rules built into user entry screens within Oracle EBS and PeopleSoft HCM modules that prevent invalid entries which Component Interface executes 100%.
  - Use of Open Interface tables and module specific Application Interface Programs (API's) for data migration and data integration.

- **Archiving of Data:**

  The ABT Program will approach archiving in two stages.

  - The first stage deals with archiving data that is not be loaded from the legacy systems into the Production Transaction databases. This data will be archived and available for reporting.
  - The second stage will be to plan a long term strategy for efficient archival of data from the Production Transaction databases into a non-Transaction database based on business requirements and keeping the data available for reporting needs.

1.5 Assumptions

- Oracle EBS Releaes12 and PeopleSoft HCM Release 9.0 are the target systems that will be implemented.

- The initial assessment of data conversion requirements made by the ABT Team during the Detailed Implementation Plan (DIP) will meet the business processing requirements at the phased Go Live dates.
- Departmental representatives with knowledge of legacy data will be available during data mapping analysis and reconciliation.

2.0 Data Migration Strategy

The current technology landscape has various disparate software systems. The source systems so far identified are IBIS, PeopleSoft 8.9, ARMS, MSA, IVIS, AIRS, BUC and TRH, PONS among other side systems. The future technology landscape envisions implementing several modules in Oracle EBS Release 12 and PeopleSoft HCM Release 9.0.

The objectives of the data migration strategy is to provide a comprehensive conversion blueprint of the activities and approach that the Implementation Team would take in order to accomplish migration of data from various legacy systems to Oracle EBS and PeopleSoft HCM modules.

This document addresses various areas of conversion process which impact the project timelines, thus determining the success of this implementation phase

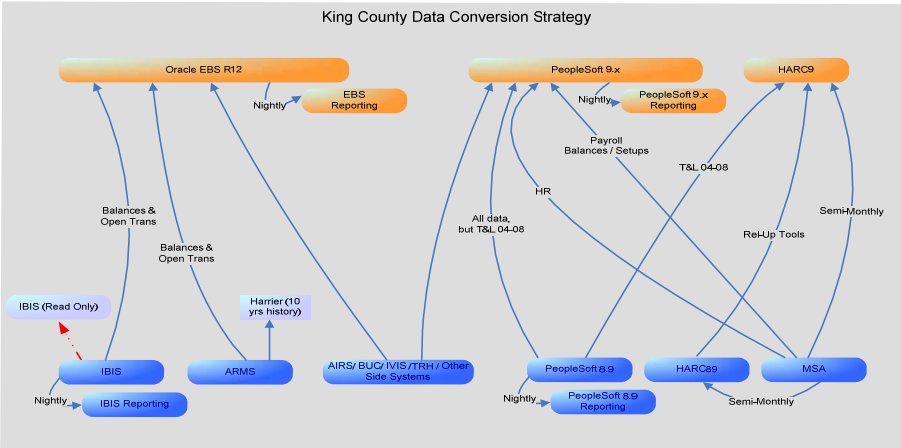
1. Data Migration Scope
2. Data Migration Approach
3. Migration Tools
4. Communication and Coordination

2.1. Data Migration Scope

The Implementation Team in collaboration with King County representatives has performed an analysis to determine whether or not the data should be brought into Oracle EBS and PeopleSoft HCM modules. Based on the outcome of the discussions, the following has been determined to be the scope of the conversion.

Some of the key decisions are listed below.

- Oracle IBIS is an Oracle Applications Release 11.5.10 and will be re-implemented using Oracle EBS Release 12 along with incorporating certain additional modules within Oracle EBS suite.
    - It was determined that only open transactions and current balance or monthly balances will be migrated to Oracle EBS.
    - Configuration data will be migrated to Oracle EBS such as Vendor and Item Masters
    - Historical data will not be converted into Oracle EBS. IBIS will be set to read-only and be kept as an archive database for a period of time. ARMS data will be sent to the Harrier Web Reporting Server until archived.
- PeopleSoft 8.9 will be re-implemented using PeopleSoft HCM Release 9.0 along with incorporating certain additional modules within PeopleSoft HCM 9.0 suite.
    - It was determined that all data that exists in PeopleSoft 8.9, with the exception of Time and Labor data and Benefit Participation (BAS_PARTIC) transactions will be brought over into PeopleSoft HCM 9.0. These sets of data account for the two major performance issues in the current PeopleSoft 8.9 system.
        - Time and Labor data from years 2004 thru 2008 will be sent to the Archive Database after being upgraded with any release 9.0 schema changes.
        - Benefit Participation (BAS_PARTIC) transactions older than November 2006 will be dropped. This data is not needed for historical retention or reporting, so dropping (deleting) it is not a problem.
    - Decommissioning Systems: Data from Core Legacy systems that are recommended for retirement. (IBIS, ARMS, AIRS, BUS,PFM, IVIS, TRH, MSA and POL) - See the Archiving Section of this document.
        - It was determined that only balances will be migrated to Oracle EBS from ARMS.
        - It was determined that only open transactions will be migrated to Oracle EBS from retirement systems such as AIRS, BUC,PFM, IVIS, TRH etc..
        - The remaining HR data in MSA will be migrated to PeopleSoft HCM.
        - Semimonthly payroll balances and deductions will be migrated to PeopleSoft HCM, but not payroll history.



2.1.1 PeopleSoft HCM 9.0 Migration

The following lists the major potential conversion data segments based upon general requirements commonly encountered during implementations. Data segments should be converted in the order in which they are presented here to adhere to built-in data dependencies.

The list also consolidates all conversion-relevant information from the individual, module-specific fit/gap sessions. While this document attempts to cover all significant aspects, the reader is referred to the Detailed Implementation Plan's Fit/Gap Analysis Strategy Plan and the detail worksheets from applicable sessions for further information.

Many of the table entries below do not show source systems or further detailed explanations. Instead, they are intended as a checklist so that specific conversion requirements uncovered during subsequent implementation phases can be tracked in a central place.

2.1.1.1 HCM and Supplemental Data

The loading of data into PeopleSoft HCM 9.0 will be completed in stages that match the overall phases of the ABT Program. These data load stages are as follows:

Data Load Stage 1 – Migrate PeopleSoft 8.9 Data to PeopleSoft HCM 9.0.

After the initial install and configuration, existing data from PeopleSoft 8.9 will be upgraded and moved into the new schema for PeopleSoft HCM 9.0. This process will be a hybrid upgrade using Oracle database tools. Data volumes for the initial PeopleSoft HCM 9.0 database are based on these approximated numbers:

1) The current 8.9 database of 140-150 gig,
2) All employees already in the system which includes 6,000 employees paid by PeopleSoft and 12,000 paid by MSA.
3) HR data for the 12,000 MSA employees being move to PeopleSoft.
4) Payroll data for biweekly employees from mid-1999

5) Reduction of Time Entry (10 million) and Benefits (5 million) transactions tables as detailed below:

The chart below lists the data that will be moved by Record Type

PeopleSoft Table	Migration Notes
Personal Data	Convert all employees currently in PeopleSoft and all historical rows of data
Job Data	Convert all employees currently in PeopleSoft and all historical rows of data
Job Data	Convert current data to create top of stack, current Job row for all **MSA** employees
Benefit Program Participation	Convert all employees currently in PeopleSoft and all historical rows of data
Person Organization Assignment	Convert all employees currently in PeopleSoft **NOTE:** Most of these are date fields and will require careful data mapping
Person Organization Assignment	Convert current data to create top of stack, current row for all **MSA** employees
BAS Partic	**Convert only date with effective date =>11/01/06. Benefits will be required to run a Snapshot at deployment and prior to rolling system to other users.**
Health Benefit	Convert all employees currently in PeopleSoft and all historical rows of data
Health Dependent	Convert all employees currently in PeopleSoft and all historical rows of data
Life and ADD Benefit	Convert all employees currently in PeopleSoft and all historical rows of data
Life and ADD Dependent	Convert all employees currently in PeopleSoft and all historical rows of data
Disability Benefit	Convert all employees currently in PeopleSoft and all historical rows of data
Savings Benefit (Deferred Comp - 457)	Convert all employees currently in PeopleSoft and all historical rows of data
Leave Benefit	Convert all employees currently in PeopleSoft and all historical rows of data
FSA Benefit	Convert all employees currently in PeopleSoft and all historical rows of data
PERS Benefit	Convert all employees currently in PeopleSoft and all historical rows of data
Retirement Reporting (Custom bolt-on must be brought forward)	Migrate all data that supports the bolt-on subsystem (every table that begins with KCP3_)
Paycheck Data (including MSA)	Convert all employees currently in PeopleSoft and all historical rows of data. **NOTE:** For retirement system calculation purposes, the county requires minimum 60 years of data
Direct Deposit Data	Convert all employees currently in PeopleSoft and all historical rows of data
Tax Data	Convert all employees currently in PeopleSoft and all historical rows of data
Earnings	Convert all employees currently in PeopleSoft and all historical rows of data
Deductions	Convert all employees currently in PeopleSoft and all historical rows of data
One Time Earnings	Convert all employees currently in PeopleSoft and all historical rows of data

PeopleSoft Table	Migration Notes
Garnishments	Convert all employees currently in PeopleSoft and all historical rows of data
Deduction Balances	Convert all employees currently in PeopleSoft and all historical rows of data
Earnings Balances	Convert all employees currently in PeopleSoft and all historical rows of data
Tax Balances	Convert all employees currently in PeopleSoft and all historical rows of data
Leave Balances	Convert all employees currently in PeopleSoft and all historical rows of data
T&L Employee Data and related records	Convert current pay year data and archive other historical data
Training - all records and tables	Convert all employees currently in PeopleSoft and all historical rows of data
Recruiting - all records and tables	Convert all data in PeopleSoft 8.9; determine need for archiving or deleting old applicant information
Security	Convert all rows of security data in tables
HR Foundation Tables	Convert all rows of data in base HR tables for foundation in organization and Job Attributes menu items
Base Benefit Tables	Convert all rows of data in base benefits tables
Benefits Administration Tables	Convert all rows of data in benefits Administration tables
Payroll Tables	Convert all rows of data in payroll for NA tables
T&L Tables	Convert all rows of data in Time &Labor tables

Data Load Stage 2 – Migrate MSA HR Data to PeopleSoft 9.0.

Since much of the MSA HR data is already interfaced to PeopleSoft on a daily basis using Application Engine and Component Interface technology that applies the King County edits and business rules, the MSA HR load strategy is to enhance this interface for a final run that incorporates the rest of the missing HR data. This MSA data will be mapped to the PeopleSoft tables and loaded. This conversion will be adding new effective dated rows to the existing HR records.

Data Load Stage 3 – Migrate POL/MSA Payroll Data to PeopleSoft 9.0.

Within the ABT Program phased rollout, agencies and departments will be moved from semimonthly to biweekly payroll cycles. Again, the data will be loaded using Application Engine and Component Interface technology that applies the King County edits and business rules. As this occurs for each rollout, data mapping and conversion will occur following the guidelines listed below:

PeopleSoft Table	Migration Notes
Job Data	Create a new JOB row for Pay Group, etc. change to biweekly (recommend first day of Pay Period)
Direct Deposit Data	Convert current data to create top of stack with the same effdt as the biweekly JOB row
Tax Data	Convert current data to create top of stack with the same effdt as the biweekly JOB row
Earnings	Convert current data to create top of

PeopleSoft Table	Migration Notes
	stack with the same effdt as the biweekly JOB row
Deductions	Convert current data to create top of stack with the same effdt as the biweekly JOB row **NOTE:** Exclude Benefit deductions
One Time Earnings	Convert current data to create top of stack with the same effdt as the biweekly JOB row
Deduction Balances	Convert current data to create top of stack with the same effdt as the biweekly JOB row
Earnings Balances	Convert current data to create top of stack with the same effdt as the biweekly JOB row
Tax Balances	Convert current data to create top of stack with the same effdt as the biweekly JOB row
Paycheck Data	Convert current data to create top of stack with the same effdt as the biweekly JOB row
Direct Deposit Data	Convert current data to create top of stack with the same effdt as the biweekly JOB row
Tax Data	Convert current data to create top of stack with the same effdt as the biweekly JOB row
Earnings	Convert current data to create top of stack with the same effdt as the biweekly JOB row
Deductions	Convert current data to create top of stack with the same effdt as the biweekly JOB row
Garnishments	Convert current data to create top of stack with the same effdt as the biweekly JOB row
One Time Earnings	Convert current data to create top of stack with the same effdt as the biweekly JOB row
Leave Balances	Convert current data to create top of stack with the same effdt as the biweekly JOB row
Deduction Balances	Convert current data to create top of stack with the same effdt as the biweekly JOB row
Earnings Balances	Convert current data to create top of stack with the same effdt as the biweekly JOB row
Tax Balances	Convert current data to create top of stack with the same effdt as the biweekly JOB row
T&L Employee Data and rules and records	Manually create Time &Labor rules and related data.

Note: effect = effective dated rows

Data Load Stage 4 – Migrate Side System Data to PeopleSoft 9.0.

As PeopleSoft functionality is rolled and departmental side systems are retired, some of the data captured in those systems will be loaded into the core system. Certain side system training tracking systems have training information not already tracked in the centralized implementation of the PeopleSoft training module, and may require migration to the new core system. This work will be evaluated for each side system to determine if an automated load can be cost justified or if a manual load makes more sense.

2.1.2 Oracle EBS Migration

The first phase of Data Conversions would involve migrating data from Oracle Release 11 (IBIS) to Oracle EBS Release 12. The loading of data will be completed in phases that match the overall phases of the ABT Program.

Unless otherwise noted, the volume of converted data is based on:

Estimated Finance Conversion Balances

Based on 2007 Year End Balances

ARMS- Revenue Expenditure	Low Org/Account	32,388
ARMS- Balance sheet	Fund/Account	15,865
IBIS- Revenue Expenditure	Cost Center/Account	34,665
IBIS- Balance sheet	Fund Account	867
	TOTAL	**83,785**

Below is the list of data conversions that need to be performed for each phase of the implementation.

Source System	Target System	Purpose	Effort	Comments
Oracle IBIS / Legacy Systems	Oracle GL	GL Balances	Low	Prior-year ending balance & current year summarized by month for mid-year conversions
Oracle IBIS / Legacy Systems	Oracle GL	Chart of Accounts - Segment Values	Low	New Chart of Account values
Oracle IBIS / Legacy Systems	Oracle GL	GL Budgets	Med	Current year budgets (adopted and current)
Oracle IBIS / Legacy Systems	Oracle AP	AP Invoices /Credit Memos /Debit Memos	Med	Only Open AP invoices/Credit Memos /Debit Memos. Assumption is that KC will pay as many as possible in legacy system
Oracle IBIS / Legacy Systems	Oracle AP	Supplier Banks/Accounts	High	

Source System	Target System	Purpose	Effort	Comments
Oracle IBIS / Legacy Systems	Oracle PO	Suppliers	High	Convert all vendors to EBS Phase 1 and make EBS system of record for all county suppliers.
Oracle IBIS / Legacy Systems	Oracle PO	Purchase Orders	Med	Open Purchase orders only
Oracle IBIS / Legacy Systems	Oracle PO	Requisitions	Med	
Oracle IBIS / Legacy Systems	Oracle PO	Commodity Codes	Med	New NIGP codes
Oracle IBIS / Legacy Systems	Oracle PO	Receipts	Med	Conversion program will bring in Unmatched receipts only
Oracle IBIS / Legacy Systems	Oracle PA	Projects / Tasks / Key Members / Classifications /Projects Assets	High +	Project inception-to-date costs for 15,400 Projects must be summarized to a single expenditure type
Oracle IBIS / Legacy Systems	Oracle PA	Expenditure Items	Low	Project inception-to-date costs for 15,400 Projects must be summarized to a single expenditure type. Current year summarized by month for mid-year conversions
Oracle IBIS / Legacy Systems	Oracle PA	Project Budgets	Med	Populate 15,400 Project budgets using AMG API
Oracle IBIS / Legacy Systems	Oracle OM	Open Sales Orders	Med	
Oracle IBIS / Legacy Systems	Oracle INV	Items	High	30,000 items for conversion
Oracle IBIS / Legacy Systems	Oracle INV	On-hand Balances & Cost	Med	Current on-hand balance and costs
Oracle IBIS / Legacy Systems	Oracle INV	Catalogs	Med	Assumes 663 catalogs
Oracle IBIS / Legacy Systems	Oracle AR	AR Customers	High	Convert customers as necessary as phasing plan requires
Oracle IBIS / Legacy Systems	Oracle AR	AR Invoices /Credit Memos /Debit Memos	Med	Only Open AR invoices /Credit Memos /Debit Memos
Oracle IBIS / Legacy Systems	Oracle AR	Open AR Cash Receipts	Med	
Oracle IBIS / Legacy Systems	Oracle FA	Fixed Assets	High	40,000 assets, converted in phases as required to retire ARMS / IVIS
Oracle IBIS / Legacy Systems	Oracle HR	Employees / Assignments	Med	One time Conversion is needed
Oracle IBIS / Legacy Systems	Oracle HR	HR Work Structures (Jobs, Positions and Organizations / Locations)	High	One time Conversion is needed
Oracle IBIS / Legacy Systems	System Administration	User Accounts	Low	All users who need an Oracle account.
Oracle IBIS / Legacy Systems	System Administration	Assigning Responsibilities to Users	Low	New EBS12 Responsibilities

2.2 Major Mapping Activities

Data migrations are planned from IBIS, PeopleSoft 8.9, ARMS, MSA and other legacy systems. Oracle EBS and PeopleSoft HCM 9.0 are being re-implemented. The matrix below identifies some of the major mapping activities that need to happen for data conversion. While most conversions need some data mapping, these are being called out as needing larger amounts of business knowledge and time to create the mapping rules and values.

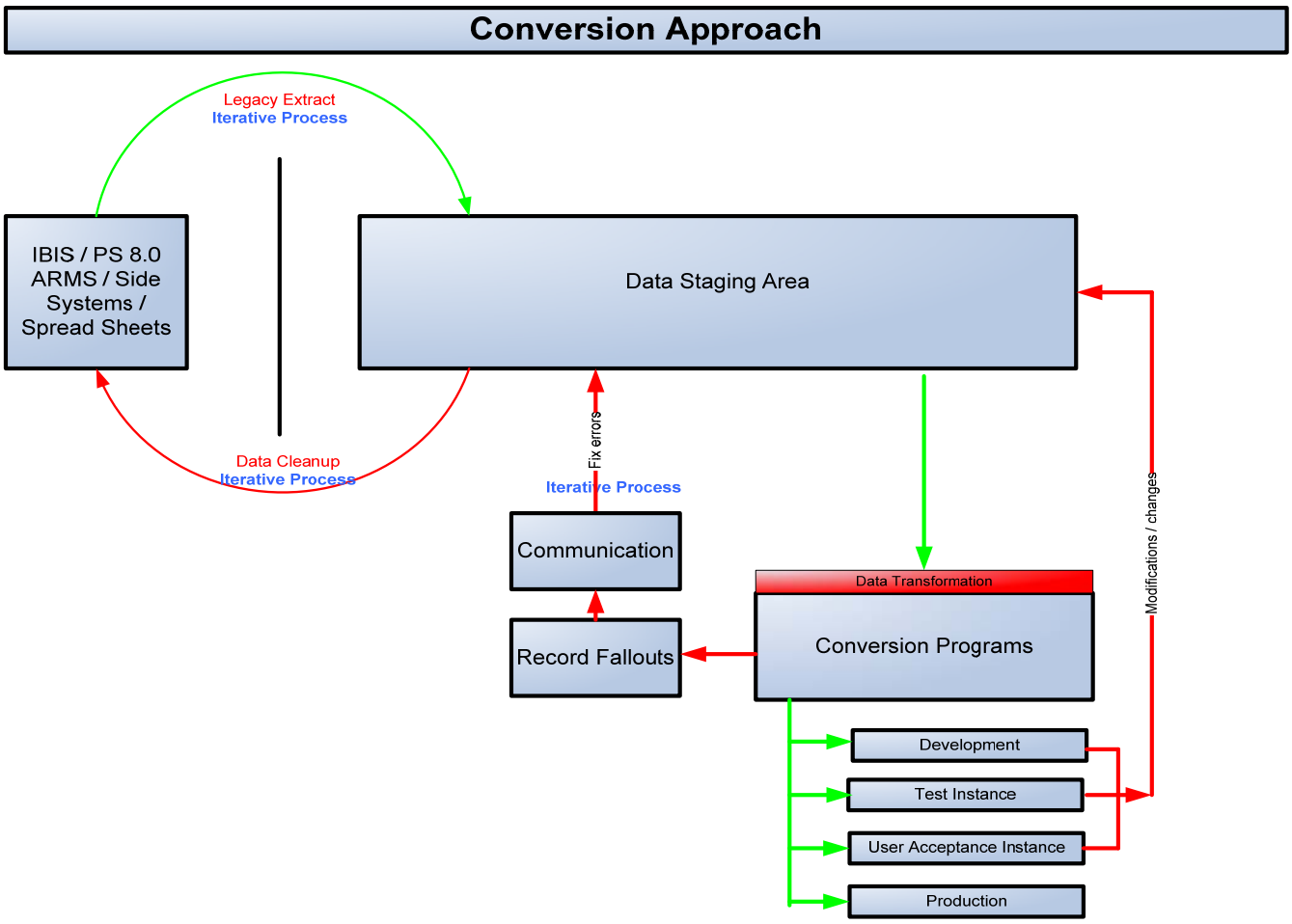
Task Name	Purpose
GL Cross Walk	GL Cross walk needs to be built to map old accounting values from IBIS and ARMS to the newly defined accounting values in Oracle EBS
Position Crosswalk	The MSA Position number will be stored in PeopleSoft Position Management to provide a way to continue to pass this information to MSA until all employees are paid in PeopleSoft.
Department Low Org Cross Walk	Department numbers assigned to employees in PeopleSoft are a variation of Low Org. So, department id A1041 equates to MSA department 1041. When we rebuild the organization structure in PeopleSoft, the department number assigned to the position / employee will not be as closely aligned.
JOB CLASS	KC_JOB_CLASS provides the cross walk between King County Class Specification and MSA job class. Note: This table is a potential target for modification reduction.
Commodity Codes	Affects PO, Assets/IVIS, Inventory

2.3 Data Migration Approach

The objective of the data migration approach is to develop a framework to allow a one-time migration of data from existing source systems to the Oracle EBS and PeopleSoft HCM modules.

The recommended data migration approach for ABT Program is to build *custom programs* that use a combination of tools provided by Oracle are free of charge and come seeded as part of Oracle EBS and PeopleSoft HCM toolset. The approach outlines building the data migration process that covers the following aspects of data migrations.

- Data Preparation
- Data Extract
- Data Transformation
- Data Load
- Monitoring and Control
- Mock Conversion
- Handling Sensitive Data
- Conversion Approvals.
- Roles and Responsibilities



2.3.1 Data Preparation

Data Mapping: Once data has been identified in the source application, each data item is mapped to the target application. Mapping addresses the data type, length and format for data item. It also addresses if a particular data item is mandatory in the target application.

Data Cleanup: Legacy data systems hold large volumes of data that may be redundant or duplicate or may be in different formats and many times contain invalid values. Hence, clean data is central to any data migration process as it impacts timelines and is often a time consuming process. This effort would have been significant but for the recently completed MSA Online Project in which much of this data cleanup has already been completed. The Financials, Projects and Purchasing data is likely to require more significant cleanup than the HR and Payroll data.

2.3.2 Data Extract

Once the source data has been prepared, it is ready to be extracted. For file-based processing, this will result in one or multiple flat files to be created in the source environment. For database-to-database models, such as bulk copy or other database-native commands or utilities, the extract step includes the creation of source-side scripts necessary to perform the extraction.

The files that are extracted can be in flat files, or database views/tables that can be read by the conversion programs.

2.3.3 Data Transformation

During data conversion process, certain legacy data is interpreted to create a meaningful record in the target application. Data transformation will be handled in the conversion programs using the following methods.

- Cross Reference tables
  - Cross reference tables are used to hold values of some legacy data items and their equivalent values in the target application. The conversion programs use the cross reference table to interpret the value that needs to replace a particular legacy data item.
- Logic built into custom programs
  - Open Interfaces and/or API's require certain codes to be passed in order for these programs to interpret the correct meaning. These codes are usually validated, hence the logic will be built into the conversion programs to pass the correct codes to these open interfaces and/or API's

2.3.4 Data Load

The key to successfully completing this step is data integrity and ensuring that all data is correctly loaded in the application tables. To ensure the integrity and accuracy of data, Oracle Application Program Interface (API's) and/or Oracle Open Interface Tables will be utilized. The APIs and Open Interface Tables use pre-packaged executable PL/SQL packages, which have built-in checks to ensure data integrity and accuracy, thus providing additional data validation during the conversion process.

Data loading into the target application is an iterative process and is performed using various tools. The tools are listed below.

- Programmatic data conversion (SQL/PLSQL/Oracle APIs)
- DataLoader
- Application Desktop Integrator (ADI/WEBADI)
- Manual entry

2.3.5 Monitoring and Control

Converted data will be a corner stone of the implementation. As such, data verification and integrity checking is performed thoroughly and often. For this, two methods are available: batch and on-line verifications. A set of quality metrics are established for each step in the conversion cycle. These metrics should be evaluated after each step, so that discrepancies can be pinpointed and resolved quickly.

- Batch programs, SQL scripts, or a query tool can be used to check for parent/child relationships and perform other validation checking. When considering batch verification, existing reports on both the source and the target systems be examined for usability in an effort to make the most efficient use of available resources.

- Online data verification is done as a random visual inspection of data to assess the data validity and also to verify that the data appears in the correct fields for display and in the correct format.

2.3.4.6 Mock Conversions

Mock conversions, or trial runs, will allow the Implementation Team to test the conversion processes. This iterative process will provide an opportunity to verify converted data so that necessary adjustments can be made to the conversion processes prior to the go live conversion. In addition, trial runs allow a more accurate assessment of the actual time necessary for the final conversion. The goal of the mock conversions is to make the actual conversion as smooth as possible.

2.3.7 Handling Sensitive Data

Certain data elements are sensitive in nature such as Social Security numbers, employee address, HIPAA data, etc. This information is - while needed in its original form- needs to be masked in all databases, except for conversion reconciliation database and the production database. Sensitive data will be identified during the implementation discovery phase.

2.3.8 Conversion Approvals:

Migration process needs to be approved at each major milestone. Approvals are listed against the major milestones in the approvals section below.

- Conversion List approval
- Design documents are approved in conversion planning phase
- Approvals given for conversions in production database after validations are done in test instances.
- Approvals given once production database is loaded and validated.

Approvals would be done at the major milestones

Milestone	Purpose
Discovery	Inventory of conversion by module
Design	Conversion design specification with rules for mapping and transformation.
Development	Validation of converted data
Deployment	Production approvals

2.3.9. Roles and Responsibilities

Conversion development requires active participation of the project team members working in a collaborative environment with departments. The ABT Implementation Team made up of consultants and county staff will assume a leadership role in the development of conversion programs.

Data migration effort requires a System Integrator and five different types of resources working in a collaborative environment. They are:

- System Integrator: The role of the system integrator will lead the data migration effort and mentor the county staff, as needed, in all development areas from designing specifications to development and testing.
- Department Data Owner: The role of the data owner will include review and approval of correct or appropriate source of data, perform data cleansing in the legacy system, correct or appropriate structure of data format/record and that the results of the conversion produced valid results.
- Department Data Analyst: The role of the data analyst will include review and approval of data and will include data mapping from old to new.
- ABT Functional Lead: The role of the functional lead will include review and approval of the mapping of functional impact back to design and validate and reconcile data once conversion of data.
- ABT System Integration Functional: The role of the system integration functional will include review and approval of mapping to use case and screens. The system integrator functional will also provide a detailed conversion design document along with rules for transformation and data validation. The document will be used by the technical developers to write conversion programs
- ABT Technical Developer: The role of the technical developer will include responsibilities for writing conversion programs which will include transformation rules and data validations, Load Data into Target tables, and providing a list of exceptions. The technical developer will also provide a conversion design document that lists conversion steps. This technical effort will consist of both system integrator and county staff.

2.4 Tools for Conversion

The current technology landscape has various software systems. The source systems so far identified

are IBIS, PeopleSoft 8.9, ARMS, MSA, IVIS, AIRS, BUC among other side systems.

Conversion tools that are recommended for use are evaluated below. These are mentioned for data migration and address data duplicity, data inconsistencies and other data formatting issues.

- *Data Cleanup:* Clean data is central to any data migration process as it impacts timelines and is often a time consuming process. Identifying duplicate records, merging of record, enriching the data, and other data formatting issues are addressed as part of the conversion approach

- *Data Mapping:* Data mapping is a function of mapping the legacy data items to each data item in the target application. Mapping addresses the data type, length and format for data item. The conversion design document developed by the technical and functional teams address the data mapping activity and is done independent of the tool used for data conversion.

- *Data transformation:* Certain data items from legacy systems need to be interpreted differently to ensure that the target application requirements are met. The Implementation Team will lay out the transformation requirements as business rules that will be built into the conversion programs.

- *Data Loading:* Data loading into the target application is an iterative process and is performed using various development tools provided by Oracle.

- *Cost:* Several development tools provided by Oracle are free of charge and come seeded as part of Oracle EBS and PeopleSoft HCM toolset. It is recommended that the Implementation Team use the available toolset for data migration.

The recommended tools that will be used for data migration into Oracle EBS and PeopleSoft application are listed below.

Oracle EBS Data Migration toolset

- Programmatic Conversion (SQL Loader / SQL / PLSQL / APIs)
- Data Loader
- Application Desktop Integrator (ADI)
- Manual data conversion

2.4.1. Programmatic Conversion (SQL Loader / SQL / PLSQL / APIs)

SQL and PLSQL allows for writing custom logic to handle complex data manipulation and data transformation. Generally, data is loaded in staging tables into Oracle database using SQL Loader programs. A custom program is then written to manipulate the data and load into the standard Oracle Open Interface tables or API's.

The standard Oracle Interface program is then runs to load the data into the Oracle module with full validation and includes exception reports.

The reason for using SQL and PL/SQL is that complex and detailed data manipulation is done far better using SQL and PL/SQL. Large volumes of data also handle better using SQL / PLSQL.

The following conversions will be handled by the this conversion approach

- Oracle Human Resources
  - Employee Conversion
  - Employee Assignment Conversion
- Oracle Payables
  - AP Invoices/Credit Memos/Debit Memos
- Oracle Purchasing
  - Supplier Banks/Accounts
  - Suppliers
  - Purchase Orders
  - Requisitions
  - Commodity Codes
  - Receipts
- Oracle Projects
  - Projects / Tasks / Key Members / Classifications /Projects Assets
  - Expenditure Items
  - Project Budgets
- Oracle Receivables
  - AR Customers
  - AR Invoices /Credit Memos /Debit Memos
  - Open AR Cash Receipts

2.4.2. Data Loader

Data Loader is a third party utility that loads data into the Oracle application running in Windows. Data Loader loads data through the forms. Data Loader scripts can be created by non-technical users in their respective Enterprise Resource Planning (ERP) modules. The scripts are reusable and can be migrated from instance to instance.

The following conversions will be handled by the this conversion approach

- Oracle General Ledger
  - GL Value Set Values

- Oracle Human Resources
  - HR Organization
  - Jobs
  - HR Locations
- System Administration
  - User Accounts Creation
  - Responsibility Assignment

2.4.3. Application Desktop Integrator

Application Desktop Integrator (ADI or WEBADI) is a tool provided by Oracle to upload and download data into spreadsheets. ADI is tightly integrated with Oracle Applications and is used extensively across several modules with Oracle ERP applications.

Depending on the data volume, the following conversions will be performed using ADI

- Oracle General Ledger
  - GL Balances

- Fixed Assets
  - Assets

2.4.4. Manual data conversion

For data where the volume does not justify development of programmatic data conversion solutions, the data will be manually converted. This often also provides a valuable training exercise for system users. This approach is typically utilized for reference (setup) data. Data with less than 500 rows is typically converted manually.

PeopleSoft Data Migration toolset

- Application Engine (AE)
- Component Interface (CI)

2.4.5. Application Engine

Application Engine is commonly referred to as AE, allows you to create applications that perform background SQL and PeopleCode processing against your data. It executes the SQL you provide it. AE programs provide for effective date processing logic, the ability to specify platform specific SQL, the ability to process group (i.e. sets) of rows at one time, the ability to process one row at a time and can execute PeopleCode. AE programs can also invoke a COBOL program using RemoteCall. An AE program can be executed in batches using the Process Scheduler, invoked synchronously using the CallAppEngine PeopleCode function, or invoked asynchronously via the ProcessRequest PeopleCode object. AE programs run on the application server (i.e. Windows NT or Unix server).

Implementing AE using set based processing is the desired approach when possible for new batch processing at PeopleSoft. "Row-at-a-time" PeopleCode processing should only be used when you are confident that it will not lead to performance problems.

Use Application Engine when:

- Need to process a number of rows in a table in batches using set based or row based processing.
- Want to load a flat file to a table, or unload a table to a flat file in batch using the Process Scheduler.
- Need to write a subscription process in Application Messaging.
- want to execute a common set of logic from PeopleCode, and not wait for the called program to complete before executing the next statement in the calling program (i.e. when you want to execute an asynchronous subroutine using the ProcessRequest PeopleCode object).
- want to execute a common set of logic from PeopleCode and wait for the called program to complete before executing the next statement in the calling program (i.e. when you want to execute a synchronous subroutine using the CallAppEngine PeopleCode function). Use AE if the common logic will also be used to process high volumes in a batch mode, otherwise use a PeopleCode function if the common logic will primarily be used for low volumes in an on-line environment.

Do not use Application Engine when:

- Need to perform lengthy and extensive computations and the performance of those calculations is critical (consider using AE calling a COBOL subroutine to perform the calculations).

2.4.6. Component Interface

Component Interfaces (CI) expose the rich functionality delivered in the hundreds of components that make up PeopleSoft products. A component is an atomic transaction which implements a business process or function. A CI provides real time synchronous access to the PeopleSoft business rules and data associated with a business component. The interface is exposed via standard access methods. CI can be viewed as "black boxes" that encapsulate PeopleSoft data and business processes, and hide the details of the structure and implementation of the underlying page and data. The actual interface consists of a set of clearly defined properties and methods that follow an object-oriented programming model. External applications can only access a component's data using the interface's specified properties or methods.

Use Component Interface when:

- Third parties must retrieve and/or update PeopleSoft data real time using request/reply synchronously.
- Want to recycle online business logic associated with a PeopleSoft component (for example in an Application Engine program or through Application Messaging).

Do not use Component Interface when:

- A process in one PeopleSoft database wants to get or update data in another PeopleSoft database in a near real time asynchronous environment (use Application Messaging).
- The processing logic you want to componentize cannot be represented by a PeopleSoft component (use a PeopleCode function or an Application Engine program passing parameters).
- Don’t want the calling program to wait while the called component completes its processing.

2.5. Communication and Coordination

Communication and coordination between various implementation partners assumes an important part in the successful implementation of ABT Program. The main areas of focus for coordination would be the following:

- List of Conversions
    - The ABT Technical Team will coordinate with the ABT Functional Team to get a list of conversion for their respective modules.
- Conversion Design Documents
    - The Technical Team will coordinate with the ABT functional team to map Legacy data to Oracle / PeopleSoft applications. The Technical Team will be providing, as a deliverable, the conversion design document for each conversion area.
- The ABT Technical Implementation Team will be responsible for sending the request for the extract files from legacy software systems to King County IT Departments. It is the intent of the Technical Team to give as much lead time to extract data files from legacy applications.

List of Conversions and need-by dates below serve as examples:

Conversion List	File need by date	Conversion Date	Conversion Instance
<GL Balances>	<Data>	<Data>	Development
<Payables Invoices>	<Data>	<Data>	Test Instance
<Assets Conversion>	<Data>	<Data>	User Acceptance Instance
<Employee Conversion>	<Date>	<Data>	Production

- Data Cleansing
    - The ABT Technical Team will provide error logs to ABT Functional Team so that cleanup may be done for those errors. Any changes to the conversion programs that may result will be fixed by the Technical Team.
- Iterations:
    - The Technical Team will coordinate with project management to obtain schedules for each iteration in order to prepare of data migration.
- Data Validation
    - The Technical Team will coordinate with ABT Functional Team to validate the data converted into the target application. Any changes to the conversion programs that may result will be fixed by the Technical Team.
- Conversion Approvals:

- The Technical Team will coordinate with project management to obtain the approvals for each conversion identified in the conversion list

3.0 On-Going Data Management

Several Data Integrity and Management Tools exist in the market place that provide comprehensive data management and address data profiling, data transformation, data merging and data formatting issues. Data profiling is grouping data together for further analysis or applying rules. For example: we can group employees based on location or job group, or group all employees into groups that do not have a social security number in the system. Profiling a group of data leads to business rules that we can apply.

A comprehensive set of business rules can be built into these tools to create a unified view of the data across the enterprise. Central to each tool is the key component of an extraction, transformation, and loading (ETL) capability that can be used for Data Migration and Data Integration.

- DataFlux
- Smart DB
- Solix
- Applimation's Informia
- Oracle Warehouse builder (OWB)

Oracle EBS and PeopleSoft HCM provide several methods by which data can be managed. As such, additional data management tool is not recommended. Data integrity and data quality can be maintained using a combination of the below.

- Rules built into user entry screens within Oracle EBS and PeopleSoft HCM modules that prevent invalid entries:
    - Oracle EBS and PeopleSoft modules provide built-in rules that prevent invalid data entries.
    - Additional business rules can be built to prevent user entry errors. (these can be addressed during the fit/gap sessions and can be part of the modification strategy)
- Open Interface tables and Application Interface Programs (API's) provide a layer of security to maintain data quality and data integrity. As such, data migration should be performed only through Open Interface tables or (API's).
- Use of PeopleSoft's Component Interface Technology that enforces all edits and business rules written into the PeopleCode.

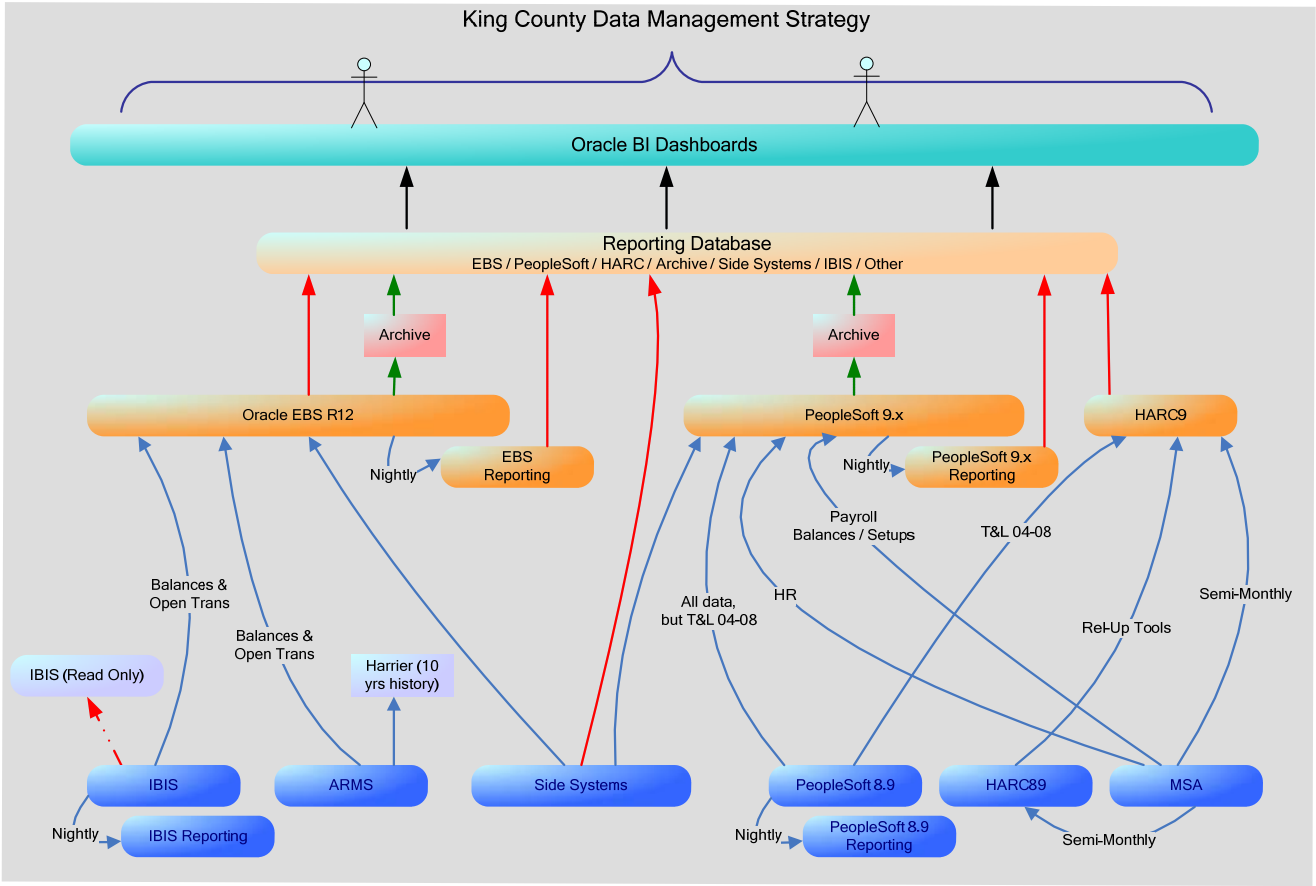
4.0 Data Archiving

The ABT Program will approach archiving in three stages.

1. The first stage will be to ensure that the data that will not be loaded from the legacy systems into the Production Transaction databases will not be lost and will continue to be available for reporting.
2. The second stage will be to plan a long term strategy for efficient archival of data from the Production Transaction databases into a non-Transaction database based on business requirements and keeping the data available for reporting needs.
3. The third stage is the decommissioning of systems and archiving data that was never converted into PeopleSoft HCM or Oracle EBS.

4.1. Archiving Scope Stage I

The implementation of Oracle EBS Release12 and PeopleSoft HCM Release 9.0 will require the migration of some data from the legacy systems into the new systems. Data that will not be migrated and still is needed for reporting will be archived in the most efficient way possible in the short term while setting the stage for Archiving Plan Stage II.



In the Data Management diagram above, the following items need to be called out under the Archiving Strategy for Phase I:

1. The existing IBIS application and data will be switched to a read-only mode and be available for reporting history and detail transactions that were not migrated. This data will be kept under the old Chart of Account structure.
2. The existing ARMS reporting using Harrier and the King County Web Reporting tools will continue to be supported to meet the business reporting requirements.
3. The HCM Archive instance of PeopleSoft 8.9 will be upgraded to the same toolset that is implemented to support the PeopleSoft HCM 9.0 Application. This instance will become an archive that is kept for research and reporting purposes. Queries can be run against this data as needed.
4. Time and Labor detailed data from years 2004 thru 2008 will be upgraded to match any schema changes so there is a match between the Production Transactions system and the Archive system. This data will be moved to the HARC9 database and will sit along side of the years1999 thru 2003 Time and Labor tables. This old data still is in the

release 7.5 schemas. This Archive step will help alleviate one of the major performance issues in the current PeopleSoft 8.9 system.

5. Currently, MSA Semimonthly Payroll Master data is loaded into the HARC89 system. This practice will continue to be loaded into the HARC9 system until MSA is no longer paying employees.

4.2. Archiving Scope Stage II

Long term planning and a recommendation will be presented with regard to archiving data. The ABT Program work will set the stage for a follow-up on an Archival Project by performing these preparation activities:

- Requirements Gathering
- Data and Reporting Analysis
- Tools Analysis
- Procurement of an Archiving Solution that will meet the county requirements
- Archiving Project Planning

The diagram has placeholders for Archiving Activities that routinely pull historic data from the transaction database and archives it to the Long Term Reporting Solution. Other data that will be made available to the Long Term Reporting Solution are:

- EBS Daily Transactions
- PeopleSoft Daily Transactions
- HCM Archive Data (HARC9) including:
    - ISI Payroll Data 1991 – 1999
    - MSA Payroll Data 1999 – Current
    - PS T&L 7.5 Data 1999 – 2003
    - PS T&L 8.9 Data 2004 – 2008
- IBIS Data (if needed)
- ARMS from Harrier 10+ years (if Needed)
- Retired Side System Data (if Needed)

King County has conducted a conceptual review for the Archive Solution, and established some planning information to use for this effort. The business drivers are listed below:

- Promotes efficiency by improving productivity and/or reduces future expenditures.
- Improves public access and customer service, by improving the quality and/or usability of internal and/or external county services.
- Improves transparency and accountability for decisions by making decisions and decision-related materials more easily available.
- Supports ability to track long-term outcomes.
- Increases architectural flexibility by utilizing commercial off-the-shelf software.
- Leverages and/or extends integration architecture.
- Improves data management by reducing data redundancy.
- Improves technology operation by enhancing system reliability.

- Standardizes or streamlines existing operations.
- Provide tactical agency operational improvements.

Glossary

Data Cleansing: Clean data is central to any data migration process as it impacts timelines and is often a time consuming process. Identifying duplicate records, merging of record, enriching the data, and other data formatting issues are addressed as part of data cleansing.

Data Masking: Certain data elements are sensitive in nature – such as Social Security number, employee address, HIPAA data etc. This information is, while it is needed in its original form, needs to be masked in all Database Instances, other that the production database.

Data Mapping: Data mapping is a function of mapping a legacy data item to a location in the target application. Mapping also addresses the data type, length and format for data item.

Data Storage: Data is stored in relational tables in a database. These relational tables are provided by Oracle and PeopleSoft as part of the software install. Additional data that needs to be stored in a database will be stored in Oracle Tables.

Data Retrieval: Data retrieval is a process of accessing data that is stored in the database. This can be done using the screen provided within each module. Additionally, Reporting tools can be used to retrieve data from the tables.

Data Retention: There are several ways that data can be retrieved. In the data exists in Oracle EBS or PeopleSoft 9 modules, then the data can be retrieved using the screen provided within each module. Additionally, Reporting tools can be used to retrieve data from the tables.

Data Migration: Data that exists in a source system is moved to a target system via a migration process.

Data Staging: An intermediate location for source data before it gets to target tables.

Data Transformation: Certain data items from legacy systems need to be interpreted differently to ensure that the target application requirements are met. For example, the source system may have the gender of a person as "1" for male and "2" for female. Oracle HR may have the gender of a person as "M" for male and "F" for female. Data needs to be transformed before it reached the target.

Data Loading: Data loading into the target application is a process of inserting data into the target tables using various development tools provided by Oracle EBS and PeopleSoft HCM.

Historical Data: Data that is not actively used in the transactional database. Historical data can exist within a core system or a side system.

Data archiving for System Performance: Data that is removed from the transactional database tables in order to enhance system performance. For example, to improve system performance, data that is over 3 years old and is not transacted against is moved to separate tables within the database or written to a tape and deleted from the transactional database.

Data Archiving for Historical Reporting: Data that is stored outside of the transactional database for historical reporting or analysis. For example, data that needs to be reported on, but has not been migrated to the production instance can be archived in a database for used as the data source for historical reporting.