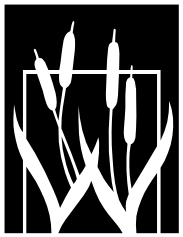

Whitemarsh
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Data Standardization Work Plan

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Phase I. Data Standardization Project Planning

1 Perform overall data standardization project planning
- 1.1 Determine and achieve consensus on overall goals and objectives
- 1.2 Determine and achieve consensus on success measures
- 1.3 Determine and achieve consensus on evaluation measures
- 1.4 Review, revise, and achieve consensus on work breakdown structure (WBS)

- 1.5 Identify business unit involvement in project and phases
  - 1.5.1 Identify the business units that are involved in the enterprise data element standardization effort.
  - 1.5.2 Ensure that business units from all different affected languages are involved in the enterprise data element standardization team
  - 1.5.3 Define the charter, time-frame, and output format for the data standardization effort

- 1.6 Identify and assign staff and accomplish project estimates
  - 1.6.1 Identify overall project manager
  - 1.6.2 Identify phase project manager
  - 1.6.3 Determine members of phase team
  - 1.6.4 Develop detailed phase estimate
  - 1.6.5 Accomplish resource loading, build PERT, Gantt and CPM charts for overall project and for phase
  - 1.6.6 Present project and phase plans and revise as necessary
  - 1.6.7 Identify and assign administrative support
  - 1.6.8 Identify and acquire automation/tools support

- 1.7 Acquire computing environment and training
  - 1.7.1 Acquire and install all hardware, software, and telecommunications necessary to support data standardization effort
  - 1.7.2 Conduct project method, administrative, and tool use training

2 Review, revise, and achieve consensus on all deliverable content and format for all comparison, difference, and resolution reports including
- 2.1 Identified enterprise data elements
- 2.2 Business domains of enterprise data elements
- 2.3 Existing enterprise data element characteristics such as business domain, value domains, and enterprise data element classifications
- 2.4 Existing enterprise data element upper level concepts, conceptual value domains, and data element concepts.

2.5 Existing compound and derived data elements involvement with enterprise data elements.
2.6 Enterprise standards (international, regional, national, and local) for enterprise data element characteristics
2.7 Difference between existing local enterprise data element standards and enterprise data element standards

3 Develop resolution mechanism for enterprise data element semantic differences including
3.1 Inter business unit automation interaction
3.2 Inter business unit human communication interaction
3.3 Estimated resources (hardware, software, peopleware, and time) required to resolve semantic differences
3.4 Identify and quantify business risk and/or impact associated with unresolved differences
3.4.1 Management level required to resolve semantic differences
3.4.2 Business unit organization responsible for semantic difference resolutions
3.4.3 Candidate procedure for difference resolution

Phase II. Data Standardization Enterprise Data Element Identification and Assessment

4 Identify, assign staff and accomplish phase estimate
- 4.1 Identify phase project manager
- 4.2 Determine members of phase team
- 4.3 Develop detailed phase estimate
- 4.4 Accomplish resource loading, build PERT, Gantt and CPM charts for phase
- 4.5 Present phase plans and revise as necessary
- 4.6 Identify and assign administrative support
- 4.7 Identify and acquire automation/tools support

5 Identify or develop mission and perform analysis
- 5.1 Identify or create overall mission for data standardization area[1]
- 5.2 Create appropriate subordinate missions relevant to the data standardization area
- 5.3 Create mission for data standardization area
  - 5.3.1 Analyze the scope, purpose and coverage of the data standardization area
  - 5.3.2 Create a comprehensive set of subordinate missions
- 5.4 Create, store and validate through reporting the mapping between enterprise standard missions and the missions of the data standardization area
- 5.5 Create mission comparison, differences, and resolution report
- 5.6 Analyze report, rank issues, and make assignments for differences resolution
- 5.7 Identify relevant database domains

6 Identify or develop database domains and perform analysis
- 6.1 Select or create appropriate database domains
- 6.2 Create appropriate subordinate database domains relevant to the area of the data standardization area
- 6.3 Create database domains for data standardization area
  - 6.3.1 Analyze the scope, purpose and coverage of the data standardization area's database domains
  - 6.3.2 Create a comprehensive set of subordinate database domains

[1] Here, a data standardization area may be a business area, collection of data processing programs, databases, and systems, or a application software package that is being analyzed for data standardization.

6.4 Create, store and validate through reporting the mapping between enterprise standard database domains and the database domains of the data standardization area
6.5 Create database domain comparison, differences, and resolution report
6.6 Analyze report, rank issues, and make assignments for differences resolution
6.7 Identify relevant database objects

7 Identify or develop database objects[2] and perform analysis
7.1 Select or create appropriate database objects
7.1.1 Identify appropriate international database objects
7.1.2 Identify appropriate regional database objects
7.1.3 Identify appropriate national database objects
7.1.4 Identify appropriate local database objects

7.2 Analyze the scope, purpose and coverage of the data standardization area's database objects
7.3 Create, store and validate through reporting the mapping between enterprise standard database objects and the database objects of the data standardization area
7.4 Create database object comparison, differences, and resolution report
7.5 Analyze report, rank issues, and make assignments for differences resolution

8 Identify or develop database object data structure analysis
8.1 Select or create appropriate database object data structures
8.1.1 Identify appropriate international database object data structures
8.1.2 Identify appropriate regional database object data structures
8.1.3 Identify appropriate national database object data structures
8.1.4 Identify appropriate local database object data structures

8.2 Analyze the scope, purpose and coverage of the data standardization area's database object data structures as evidenced through its tables and/or files
8.3 Create, store and validate through reporting the mapping between enterprise standard database object data structures and the database object data structures of the data standardization area
8.4 Create database object data structure comparison, differences and resolution report
8.5 Analyze report, rank issues, and make assignments for differences resolution

[2] Database objects contain four parts: data structure, database object processes, database object information systems, and database object states. During this part of the data standardization area's analysis, only the name and description of the object itself is necessary.

9 Perform enterprise data element analysis

9.1 Select or create appropriate enterprise data elements [3] including

9.1.1 International enterprise data elements

9.1.2 Regional enterprise data elements

9.1.3 National enterprise data elements

9.1.4 Local enterprise data elements

9.2 Select or create semantics for enterprise data elements including

9.2.1 Semantics that include

9.2.1.1 Business domain

9.2.1.2 Common business name

9.2.1.3 Policy description

9.2.1.4 Data structure

9.2.2 Value sets that include

9.2.2.1 Enterprise data element data integrity rules

9.2.2.2 Null

9.2.2.3 Valid values

9.2.2.4 Invalid values

9.2.2.5 Ranges

9.2.2.6 Codes (short and long values)

9.3 Identify data standardization area's enterprise data element deployment

9.3.1 Examine data standardization area's database tables and files

9.3.2 Identify each column from a database or field from a file

9.3.3 Create data standardization area enterprise data element if none already exists for column mapping

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[3] A data element is *appropriate* for semantic standardization (name, definition, and allowed value set) whenever:

1) The quantity of a data element's unique value set is significantly smaller than its total quantity of instances;
2) The values are employed in sort clauses;
3) When the value is employed in selection clauses;
4) When the value is used as a key discriminator in multiple databases.
5) When the data element as a table's column participates in an index (method of physical implementation)

Example:

1) Employment Type Code (Full-time, Part-Time, Temporary);
2) Print employees sorted by Location_Identifier;
3) Find employees where HR employee grade equals 5;
4) Count of HR employee grade employees by business unit by country
5) Employee Gender (indexed)

9.3.4 Map column to data standardization area enterprise data element if the enterprise data element already exists

9.4 Create, store and validate through reporting the mapping between standard enterprise data elements and the deployed uses of the enterprise data elements (that is, columns within tables) within the data standardization area

9.5 Create, store, and validate through reporting any needed Concepts, Conceptual Value Domains, Data Element Concepts and Value Domains as may be needed to support mapping from enterprise data elements

9.6 Create, store, and validate through reporting any needed enterprise data element classifications.

9.7 Create a comparison, difference, and resolution report for international, regional, national, and local enterprise data elements

9.7.1 Semantics including
9.7.1.1 Business domain
9.7.1.2 Common business name
9.7.1.3 Policy description
9.7.1.4 Data structure

9.7.2 Value sets that include
9.7.2.1 Enterprise data element data integrity rules
9.7.2.2 Null
9.7.2.3 Valid values
9.7.2.4 Invalid values
9.7.2.5 Ranges
9.7.2.6 Codes (short and long values)

9.8 Analyze report, rank issues, and make assignments for differences resolution

10 Perform table column[4] analysis
10.1 Select or create appropriate table columns including
10.1.1 International table columns
10.1.2 Regional table columns

[4] A table column represents a contextual use (e.g., DBMS table) of the semantics of an enterprise data element. Thus, this analysis must be performed for tables, screens, files, programs/processes, and reports.

10.1.3 National table columns
10.1.4 Local table columns

10.2 Select or create semantics for table columns for
10.2.1 Semantics for including
10.2.1.1 Common business domain
10.2.1.2 Modifier subclass choices
10.2.1.3 Classword subclass choices
10.2.1.4 Policy based description
10.2.1.5 Computer data type
10.2.1.6 Uniqueness specification
10.2.1.7 Relationship specification
10.2.1.8 Data structure

10.2.2 Value sets including
10.2.2.1 Enterprise data element data integrity rules
10.2.2.2 Null
10.2.2.3 Valid values
10.2.2.4 Invalid values
10.2.2.5 Ranges
10.2.2.6 Codes (short and long values)

10.3 Identify data standardization area's table columns
10.3.1 Examine data standardization area's database tables, files, screens, programs and reports
10.3.2 Identify each table column's use within the database tables, files, screens, programs and reports
10.3.3 Create enterprise data element to support mapping to the table column if the enterprise data element and/or the mapping does not already exist

10.4 Create, store and validate through reporting the mapping between standard enterprise data element and the table columns within the data standardization area

10.5 Create a comparison, difference, and resolution report for international, regional, national, and local table columns including:

10.5.1 Semantics
10.5.1.1 Common business domain
10.5.1.2 Modifier subclass choices
10.5.1.3 Classword subclass choices
10.5.1.4 Policy based description

10.5.1.5 Computer data type
10.5.1.6 Uniqueness specification
10.5.1.7 Relationship specification
10.5.1.8 Data structure

10.5.2 Value sets
10.5.2.1 Data integrity rules
10.5.2.2 Null
10.5.2.3 Valid values
10.5.2.4 Invalid values
10.5.2.5 Ranges
10.5.2.6 Codes (short and long values)

10.6 Analyze report, rank issues, and make assignments for differences resolution

11 Perform business policy research and formulation
11.1 Identify current policy basis for the table column
11.1.1 Identify current set of written documentation
11.1.1.1 Manual policy and procedure documentation
11.1.1.2 Data processing documentation
11.1.1.3 End user and field manuals documentation

11.1.2 Accomplish a full audit of all unique values by business organization implementation
11.1.3 Prepare a report indicating the full semantics and value set for the table column

12 Review and/or formulate data definitions and standards for table columns
12.1 Identify all table columns that are intended to embrace the same set of semantics and values by business unit, computing system, and database

12.2 Analyze the semantics within the table columns set to determine differences
12.2.1 Identify business units, computing systems, and databases that are in conformance with business policy
12.2.2 Identify business units, computing systems, and databases not in conformance with business policy

12.3 Analyze the values within sets of table columns to determine differences
12.3.1 Identify business units, computing systems, and databases that are in conformance with standard value sets

12.3.2 Identify business units, computing systems, and databases not in conformance with standard value sets

12.4 Determine the mapping between semantic differences for table columns

12.4.1 Determine if difference is semantics or different wording of same concepts

12.4.2 If differences reside within business unit
- 12.4.2.1 Resolve wording differences through consensus definition
- 12.4.2.2 Resolve semantics differences through policy analysis and essential differences resolution

12.4.3 If differences reside between business units
- 12.4.3.1 Resolve wording differences through consensus definition
- 12.4.3.2 Resolve semantics differences through policy analysis and essential differences resolution
- 12.4.3.3 Resolve unresolvable semantic differences among table columns
  - 12.4.3.3.1 Factor out commonality and create super type table columns
  - 12.4.3.3.2 Isolate differences and create business unit based subtype table columns
  - 12.4.3.3.3 Create and/or modify mappings between the new discovered super- and sub-type columns and enterprise data elements

12.5 Determine the mapping between value set differences among table columns

12.5.1 Determine if quantity of unique values are different

12.5.2 For same quantity of unique values, create a mapping between values representing the same semantics

12.5.3 Identify unique values that have no mappings to table columns
- 12.5.3.1 If non mapping unique values are subsets of other values then establish a super type and subtype value sets
- 12.5.3.2 If non mapping unique values are siblings of other values and are to remain then establish clear semantics
- 12.5.3.3 If non mapping unique values are to be discarded, then identify replacement unique value

12.5.4 Determine if unique value differences are due to language differences within table columns
- 12.5.4.1 Determine the language
- 12.5.4.2 Determine the mapping between the unique values in the enterprise standard language and the unique value set in the extant language
- 12.5.4.3 Enhance the enterprise data elements to include a language type enterprise data element
- 12.5.4.4 Add as may be appropriate a table column language type that maps to the enterprise level language type so that language specific value domains are supported

12.5.5 Determine if unique value differences are due to measurement type differences table columns
- 12.5.5.1 Determine the measurement type
- 12.5.5.2 Determine the mapping between the unique values in the enterprise standard measurement type and the unique value set in the extant measurement type
- 12.5.5.3 Enhance the enterprise data elements to include a measurement type enterprise data element
- 12.5.5.4 Add as may be appropriate a table column measurement type that maps to the enterprise level measurement type so that measurement specific value domains are supported

12.5.6 Determine if unique value differences are due to monetary type differences table columns
- 12.5.6.1 Determine the monetary type
- 12.5.6.2 Determine the mapping between the unique values in the enterprise standard monetary type and the unique value set in the extant monetary type
- 12.5.6.3 Enhance the enterprise data elements to include a monetary type enterprise data element
- 12.5.6.4 Add as may be appropriate a table column monetary type that maps to the enterprise level monetary type so that monetary specific value domains are supported

Phase III. Data Standardization Implementation

13 Identify, assign staff and accomplish phase estimate
- 13.1 Identify phase project manager
- 13.2 Determine members of phase team
- 13.3 Develop detailed phase estimate
- 13.4 Accomplish resource loading, build PERT, Gantt and CPM charts for phase
- 13.5 Present phase plans and revise as necessary
- 13.6 Identify and assign administrative support
- 13.7 Identify and acquire automation/tools support

14 Accomplish Enterprise Data Element Standardization
- 14.1 Obtain the report from enterprise data element standardization
- 14.2 Determine the resources (hardware, software, peopleware, and time) for required policy changes
- 14.3 Determine the resources required for operating system changes
- 14.4 Determine the resources required for existing database changes
- 14.5 Determine the resources required for historical data system changes

- 14.6 Determine the intra and inter business unit risk for not accomplishing data standardization
  - 14.6.1 Quantify the time and cost the extra computers to perform semantic and value translations
  - 14.6.2 Quantify the time and cost the extra staff to maintain systems with different semantic and values sets
  - 14.6.3 Quantify the time and cost the extra staff to perform down stream analyses on different semantic and value set reports to arrive a higher management level common semantic and value set report

15 Assignment of management for review and approval
- 15.1 Present the report that identifies, analyzes, and costs the effect of nonstandarization of critical enterprise data elements
- 15.2 Present the report that identifies the costs of a critical enterprise data element data standardization effort
- 15.3 Present the recommendation for data standardization
- 15.4 Obtain a management decision to remain the same or to proceed with data standardization effort

16 Proceed with data standardization implementation project
- 16.1 Plan project
- 16.2 Accomplish the database changes

16.3 Accomplish the existing computing system changes
16.4 Accomplish the policy and procedure changes
16.5 Accomplish the actual data value migration for current and historical data
16.6 Deliver the project results and develop lessons learned