



*Whitemarsh*  
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*Metabase Metadata Management System  
Data Interoperability Need and Solution Characteristics*

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*Metabase Metadata Management System Data Interoperability Need and Solution Characteristics*

<b>Enterprise Data Interoperability and Metadata Management Needs, Need Characteristics and Solutions</b>			
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Data interoperability strategy	<ul style="list-style-type: none"> <li>• An organization is looking for a strategy to accomplish data interoperability across a number of systems.</li> <li>• There is a large quantity of un-integrated systems. Or, there is data everywhere but information no-where, or conflicts as to answers to the same question exist.</li> <li>• An organization wants to “kick the tires” before making a commitment to a particular approach.</li> <li>• An organization wants either to engage in discussions about data interoperability problems across multiple organizations or from multiple staff members within a Department and/or projects before deciding on an approach.</li> </ul>	Data Interoperability Strategy Seminar	A two-day seminar that presents an overview of the data interoperability problem. It presents a clear and complete strategy to achieve data interoperability across a wide collection of legacy database applications. The strategy is practical and is achievable through the Data Interoperable Workshop, which features the use of the Metabase metadata management system to capture, integrate, update, and report enterprise related metadata.
Interoperable business information systems	<ul style="list-style-type: none"> <li>• An unacceptable quantity of discrete information systems and databases have been individually created over a long period of time.</li> <li>• There is the exception that there is data everywhere but information is no-where.</li> <li>• There are conflicting answers to the same question across the organization, such as How many Customers, What is the Gross Sales, Net Sales, count of employees, what’s on back-order, etc.</li> <li>• There is an unacceptable effort devoted to creating programs that do Extract-Transform-and-Load (ETL).</li> <li>• There is a need to integrate databases across functional areas of the organization to support inter-departmental and inter-functional area reports and analyses.</li> <li>• There is a need to integrate data from multiple procured packages such as SAP, or Oracle Applications, or those resulting from Mergers and Acquisitions.</li> </ul>	Data Interoperability Workshop	A five-day workshop during which 15 individuals in five groups of three work together on the integration of five legacy database schemas into one or more databases of shared data. They create the shared data systems and create the metadata specifications of all the shared data through the use of the Metabase system and a business information system generator.
Project level sets of integrated, and non-redundant artifacts across the system development life	<ul style="list-style-type: none"> <li>• Projects are needed to build data warehouses and/or a traditional business information system. These need to be planned, resourced, and started.</li> <li>• Projects that have been started but are now in trouble.</li> <li>• Many different project members who are building the same component (data model, process model, etc.) differently.</li> </ul>	Project Metabase Artifacts	The collected and stored Metabase metadata management system artifacts associated with database projects that are being accomplished by a group of architects, systems analysts and programmers. The Metabase metadata management system is installed on a group server and is used as their common work-accomplishment tool. The resulting metadata can then be



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cycle.	<ul style="list-style-type: none"> <li>• No agreement on what the project deliverables should be or how they should be constructed, integrated, and made non-redundant.</li> <li>• No overall methodology for each project, and across projects.</li> <li>• Project members are not able to access and employ each other's work.</li> <li>• There is no easy way of integrating the work products of one part of a project with another project.</li> </ul>		<p>extracted and loaded into a Department Metabase metadata management system and/or an Enterprise Metabase metadata management system.</p> <p>The domain of the metadata collected at the project level is focused at a given database project. Consequently, the metadata may well result in a stove pipe of database project specifications. It is preferred that the metadata be developed at the project level but be integrated at the Department level.</p> <p>The metadata models that are constructed for each database project are: 1) Business Information Systems, 2) Data Element, 3) Database Objects, 4) Documents and Forms, 5) Implemented Data Model, 6) Information Needs Analysis, 7) Mission, Organization, Function, and Position Assignments, 8) Operational Data Model, 9) Resource Life Cycle Analysis, 10) Specified Data Model, and 11) View Data Model.</p>
Department-wide sets of artifacts across all departmental functions and their interrelationships to project level sets of artifacts.	<ul style="list-style-type: none"> <li>• There exists collections of projects within one or more overall functional areas of the Department that have been unintegrated, conflicting, and redundant specifications.</li> <li>• There are data warehouse projects that have been built from multiple and individual operational databases and business information system projects that result in un-integrated semantics, granularities, precision, and temporal characteristics.</li> <li>• There are projects that represent the intersection of separately captured and updated data because of a consequence of multiple vendor-specific application packages that contain conflicting, redundant, and unintegrated data.</li> <li>• The projects that exist solely to extract, transform, and load data from one application system database into another database are becoming too many, too large, and that consume too many resources.</li> <li>• There are a number of traditional business information</li> </ul>	Department Metabase Artifacts	<p>The collected and stored Metabase metadata management system artifacts associated with an entire Department. That is, across multiple projects within a single Department. Work is being accomplished by a group of architects, systems analysts and programmers across multiple projects within the same Department. The Metabase metadata management system is installed on a group server and is used as their common work-accomplishment tool. The resulting metadata can then be extracted and loaded into an Enterprise Metabase metadata management system.</p> <p>The metadata models that are constructed are the same as those for individual projects except that these models contain metadata for all the projects within a department. Because the metadata is at the department level, the Data Element and Specified Data Models will have a greater quantity of metadata.</p> <p>Because the domain of the metadata is collected at the</p>



Metabase Metadata Management System Data Interoperability Need and Solution Characteristics

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<b>Need</b>	<b>Need Characteristics</b>	<b>Solution</b>	<b>Solution Description</b>
	<p>systems that are about to be planned, or started, or that are under development that are in trouble because of bad planning, under specified deliverables, and best-guess estimates.</p> <ul style="list-style-type: none"> <li>• There are project staff from different projects who build the same component (data model, process model, etc.) differently because there is no standardization on format or content.</li> <li>• There are disagreements on what the project deliverables should be or how they should be constructed.</li> <li>• There are multiple contractors who are building databases and/or systems based on deliverables that are not standardized across all the contractors.</li> <li>• There are contractors that cannot use each other's deliverables to enhance integration, to reduce conflicts or to eliminate redundancy.</li> <li>• There is no comprehensive and detailed methodology for the projects that supports deliverable integration and non-redundancy. Every project is done differently. There is no overall multi-project reporting.</li> <li>• There are project members from the different projects who not able to access another project staff's work, and who are not able to use other's work as a way to save time or to cause data and process integration.</li> <li>• There is no easy way of integrating the work products of one part of a project with another project.</li> <li>• There is a lack of Department-wide deliverables that can be used by multiple projects within and across departments.</li> </ul>		<p>department level it is less likely that there will be project centric metadata stove pipes. The various models of metadata should be integrated across all the functions and contained projects within the department. Because there is a high probability of metadata re-use, the extra time for department-wide cooperation is more than overcome by the efficiencies gained from non-redundancy and re-use. Additionally, whole collections of ETL projects are not developed.</p> <p>The metadata models that are constructed for every database project across the department are: 1) Business Information Systems, 2) Data Element, 3) Database Objects, 4) Documents and Forms, 5) Implemented Data Model, 6) Information Needs Analysis, 7) Mission, Organization, Function, and Position Assignments, 8) Operational Data Model, 9) Resource Life Cycle Analysis, 10) Specified Data Model, and 11) View Data Model.</p>
Enterprise-wide sets of artifacts across all enterprise functions and their interrelationships to department level	<ul style="list-style-type: none"> <li>• There is a need to integrate databases and business information systems across multiple departments functions in support of multi-department data warehouses to eliminate data redundancy and conflicts.</li> <li>• There is a need to develop standard Enterprise-wide data models that contain constructs to be used by different Departments and projects within those Departments to</li> </ul>	Enterprise Metabase Artifacts	<p>The collected and stored Metabase metadata management system artifacts associated with an entire Enterprise. That is, across multiple Departments and within Departments across multiple projects.</p> <p>The metadata collected at Enterprise level is focused mainly on the Mission, and Data Element models. There should be a</p>



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sets of artifacts, that in turn, relate to project related artifacts	<p>eliminate conflicting specifications unnecessary development, and reduce maintenance.</p> <ul style="list-style-type: none"> <li>● There is a need for Enterprise “data elements,” semantics, and value domains such as Gender, and Project Codes to accelerate database design, business information system development, to reduce redundant development, and to speed change impact analysis and maintenance.</li> <li>● There is a need to standardize Master data across business-essential strategic data structures to commonly employ this data across the enterprise to maximize common data and data structures reuse within databases and business information systems.</li> <li>● There is a need for a metadata management system to capture and store Master Data specifications that can be used within and across Departments and projects to make standardized data and process structures               <ol style="list-style-type: none"> <li>1. There is a need to “see across” metadata collected and employed from multiple projects from different Departments and in turn, projects across the enterprise to support the re-use of specifications that, in turn, makes the development of databases and business information systems faster, and more transparent to end-users.</li> <li>2. When multiple contractors are involved, there is a need to have the databases and/or systems based on deliverables that are standardized, non-conflicting, integrated, and non-redundant so that the most expensive component of IT, people, can be reduced and optimized.</li> <li>3. There is a need to reduce and/or eliminate the quantity of resources focused on the development and maintenance of data extract, transformation and loading projects that exist solely as a consequence of integrating separately captured and updated data from different databases. The quantity of these projects becomes reduced whenever there is an increase in the common use of Enterprise-wide data and process semantics.</li> </ol> </li> </ul>		<p>Metabase System at the enterprise level. Departments and Projects create metadata at their respective levels.</p> <p>Project metadata is integrated as much as possible across all the projects within a department, and then all projects within Communities of Interest. Department metadata is integrated as much as possible across all the departments.</p> <p>It is preferred to have an enterprise level metadata manager for both the Data Element model and the Specified Data Model.</p>



<b>Enterprise Data Interoperability and Metadata Management Needs, Need Characteristics and Solutions</b>			
<b>Need</b>	<b>Need Characteristics</b>	<b>Solution</b>	<b>Solution Description</b>
	<ol style="list-style-type: none"> <li>4. There is a need to harmonize standardized data structures and/or Enterprise Data Elements across Departments and projects so that development and maintenance is reduced and so that the quality of end-user use is increased.</li> <li>5. There is a need for project staff from different projects to cooperate and without conflict on the building of the same component (data model, process model, etc.) to eliminate conflicting and redundant development, and to reduce the quantity and duration of maintenance.</li> <li>6. There is a need to eliminate disagreement on project deliverables, their specifications and construction so that work can proceed more quickly with shorter reviews and easier maintenance.</li> <li>7. There is a need for a detailed and comprehensive methodology for the projects to eliminate unnecessary differences, to enable multi-project reporting, to increase re-use of commonly developed components, and to be able to re-deploy staff resources without significant retraining.</li> <li>8. There is a need for project members from the different projects to access each other's work to reduce redundantly developed artifacts, to cause data and process integration, to increase overall quality and to reduce individual project life cycle time.</li> </ol>		



*Metabase Metadata Management System Data Interoperability Need and Solution Characteristics*

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<b>Need</b>	<b>Need Characteristics</b>	<b>Solution</b>	<b>Solution Description</b>
Community of Interest Data Interoperability Specification Artifacts	<ul style="list-style-type: none"> <li>• There is a need for inter-departmental projects and supporting organizations to engineer databases and business information systems /or database data exchanges across functional communities of interest across Departments in support of reducing redundancy and increasing both data and process integration without an increase of data or process components.</li> <li>• There is a need to collect and store the Community of Interest metadata in the same rigorous fashion as it does for project and/or Department metadata so that these Community of Interest artifacts can be easily integrated and incorporated with other data and process specifications.</li> <li>• There is a need to make the Community of Interest metadata permanent and resident at the Enterprise level because it spans multiple Departments or because it spans multiple projects within a particular Department and it needs to be conserved as opposed to being redundantly specified, developed, and maintained.</li> <li>• There is a need to support queries, extracts and reports across all the organizations involved in Communities of Interest and their use of shared metadata.</li> </ul>	Metabase: Community of Interest Repository	<p>This is a use of the Metabase metadata management system to capture and store the requirements for a shared data project. Commonly there are members of this Community of Interest that come from different functional areas and belong to different project groups. The Metabase metadata management system then is to act as their shared data specification repository. Into the Metabase metadata management system is stored the Mission, Organizations and Functions related to the sharing of the data. Stored are the specifications of the data that is to be shared. Stored are the specifications of the shared data information systems. Finally stored are the business calendars of when data will be extracted from legacy environments and stored in the shared-data database. Once this Community of Interest is finished its mission, the resulting metadata can then be extracted and loaded into a Department Metabase metadata management system and/or an Enterprise Metabase metadata management system.</p> <p>The metadata collected within a Community of Interest is generally the same as that collected for a department where there is a single scope of functionality across all the projects.</p>



*Metabase Metadata Management System Data Interoperability Need and Solution Characteristics*

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<b>Need</b>	<b>Need Characteristics</b>	<b>Solution</b>	<b>Solution Description</b>
Enterprise and/or Department Information Systems Plan	<ul style="list-style-type: none"> <li>• There is a need to have an information systems plan that identifies what to build and/or maintain, when to build and/or maintain, and the overall costs to build and/or maintain databases and business information systems.</li> <li>• There is a need for the Information Systems Plan to be founded upon the same metadata that is created, developed and maintained within the metadata management system.</li> <li>• There is a need to have the Information Systems Plan easily reflect changes in both what is built and/or maintained, and in the sequence of what is built and/or maintained as these changes take place during the evolution of the metadata management system data.</li> <li>• There is a need to have an overall information systems plan defensible based on business needs with respect to enterprise missions, organizations, functions, and business events.</li> <li>• There is a need to have an Information Systems Plan call for the building of the right components at the right time and in the right sequence to maximize data and process interoperability, minimize or eliminate redundancy, and to maximize re-use of already created information technology components.</li> </ul>	Information Systems Plans and supporting Metabase metadata management system set of artifacts.	<p>This is the use of the Metabase metadata management system for capturing and using metadata for determining the right contents of business information systems, for determining their sequence, and for creating rough orders of magnitude of the resources required for their completion. Used are the existing sets of Missions, Organizations, and Functions Metadata. Used also are the existing sets of Data Models and Business Information Systems Metadata. Created in the process of developing an information systems plan are the Information Needs Analysis data that specifies the information needs of functions within organizations that are accomplishing missions, and also the Resource Life Cycle data that identifies the sequences of when (and for what purpose) information is required from the databases and information systems. Collectively this metadata is employed to identify what business information systems and databases have to be built, in what sequence, and what business functions and missions are supported when these are built.</p> <p>Finally, all this metadata is then related to the Project Management Metadata that provides the Rough Order of Magnitude for project accomplishment and also a high level methodology for accomplishing the Information System Plan projects.</p> <p>Because all the Information Systems Plan metadata is contained in the Metabase metadata management system, the metadata can be revisited, changed and new Information Systems Plans can be accomplished on a yearly basis.</p>
Metadata Management System Requirements	<ul style="list-style-type: none"> <li>• There is a need of an Enterprise and/or large Department to have a metadata management system that collects, stores, evolves, and reports the complete set of metadata artifacts required for the complete understanding of the missions, organizations, functions, databases, business information systems, and other critical metadata artifacts necessary to understand, plan, execute, and evolve the enterprise.</li> </ul>	Metabase, Metadata Management System Deployment	<p>The use of the Metabase metadata management system to capture and store the requirements for an Enterprise Metadata Management System. Given that an Enterprise is going to have a full repository such as CA Advantage, the first and necessary step is to fully define its requirements and functionality.</p> <p>The Metabase metadata management system is a very good tool</p>



*Metabase Metadata Management System Data Interoperability Need and Solution Characteristics*

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<b>Need</b>	<b>Need Characteristics</b>	<b>Solution</b>	<b>Solution Description</b>
	<ul style="list-style-type: none"> <li>• There is a need for a formal needs analysis and requirements determination prior to issuing a Request for Proposals (RFP) for, or for a custom-engineered Enterprise-wide repository so that good proposals and/or development are received and are able to be evaluated.</li> <li>• There is a need to prototype a repository within the scope of an individual project, across multiple projects within a Department, and possibly across the Enterprise before proceeding so that realistic efforts can be determined and set against determined benefits.</li> <li>• The need to accomplish the implementation of a metadata management system with the same rigor and precision as is done for quality database projects so that there can be a high probability of success given a solid set of requirements and project plans as evidenced in a rigorously defined set of deliverables, a highly engineered methodology, time line, and resources.</li> </ul>		<p>for capturing these requirements and intended functionality. Inserted into the Metabase metadata management system would then be the critical requirements information regarding the Repository’s Mission, using organizations, and functions. Included would be the required meta-entities, meta-attributes, and meta-relationships among the meta-entities. Included would be the requirements for the Business Information Systems that would be needed to scrape metadata from production environments.</p> <p>Once these requirements data were collected and stored into the Metabase metadata management system a full requirements document could be produced that could be reviewed and iterated. Once complete it could then be delivered to Repository Vendors as a Requirements Request for Proposal.</p>

