



Whitemarsh
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Metabase System Return on Investment

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1.0 Metabase System Employed Projects

This Metabase System engine has been employed in an evolving manner over the past 25+ years in a large number of settings under a number of different DBMSs. Among them are:

- The Hartford Insurance Group needed to manage the artifacts of a large collection of database centric applications in the insurance industry. This deployment managed a comprehensive set of artifacts and projects across the entire company. The resulting database represented the company's intellectual property.
- The United States Army needed to manage the development, deployment, and evolution of large quantity of logistics database applications that supported RAM (Reliability, Availability, and Reliability) analyses. There were two key "factories" in this deployment. The first was to cause both generic and specific data and process specifications, and the second was to drive the assemblies of Business Information Systems computer module components based on these specifications. The result were business information systems that cost just 20% of their original one-off costs.
- The Social Security Administration needed to manage the artifacts of two projects. The Metabase System enabled the reduction in the quantity of artifacts that had to be turned into Business Information System based components by over a factor of 4. Because of the Metabase System, the requirements, data and process models, system architecture, and the pathway to implementation was clear, obvious, and easy to evolve and maintain. The result of the Metabase System approach, there was a 4.6 times fewer data and process work products that had to be implemented to achieve the same business information system requirements.
- The Hershey Corporation needed to manage the artifacts of a large portfolio of commercial applications. This Metabase System implementation enabled Hershey to streamline the development of its enterprise data and to properly sequence the specification and build sequence of its critical supply, manufacturing, inventory, and transportation systems. Two teams were created to accomplish a real comparative study of the Metabase System centered data-driven approach compared to the traditional process driven approach. Even though the "prize" was a free steak dinner for the Metabase System team, the real winner was a 50% reduction in cost to Hershey.
- The U.S. Department of Commerce needed to manage the creation of the complete specifications of a Grant-Loan environment. The Metabase System was employed to create a complete set of object oriented data and process specifications that when printed became the complete specifications of the implementation. As change were needed, the specific defined-once specification component was changes and the complete



specification was re-generated. The ultimate work product was end-to-end consistency in data and process definitions thus making it much simpler for multiple implementation teams to arrive at an integrated and interoperable business information system end-product.

- The MITRE Corporation needed to manage the requirements, definition, and specifications of corporate infrastructure applications for human resources, finance and accounting, and the like. In this implementation of the Metabase System, the enterprise mission and data models were constructed. These formed the basis of MITRE's Resource Life Cycle tree structures that, in turn, guided the specification and sequence of its enterprise infrastructure Business Information Systems. Because of the use of Metabase System architectural components within the Oracle Designer product, the resulting work products represented the first time there had been an enterprise-wide MITRE infrastructure understanding.
- The State of California (1995) to manage the gathering of specifications of suite of already existing, state-wide, disability-population financial aid systems. These specifications were then employed to manage a large expansion of these systems functionality. In this implementation of the Metabase System, the State was able to reverse engineer an completely undocumented state-wide Business Information System for the disabled. The original contractor had built the system but did not document it. It ran on oral tradition for eight years. Once the Metabase System database was built the complete and current set of specifications and designs of the Business Information System were able to generated. Similar to the U.S. Department of Commerce use of the Metabase System above, any changes were able to be specified once and then rippled through the Business Information System.
- The Mars Corporation needed to manage the requirements and specification of a world-wide inventory management systems effort. In this version of the Metabase System, it was used to capture, characterize an existing set of inventory management systems that were employed around the world. Thereafter a unified version of inventory management was able to be constructed and cross walks to existing system specifications created for the purpose of evolution and migration.
- The INCITS (International Committee of Information Technology Standards) needed to manage the requirements, specification, and implementation of a database to manage all the American National Standards under its control (e.g. Cobol, Fortran, SCSI, and SQL). This version of the Metabase System was employed to create the Mission, Organization, Function, and Data Models for the INCITS Membership System. The data model was employed to generate the SQL DDL for the database. The function model was employed to engineer the various menu structures, which with the data model was then able to code generate the first version of the system. Because of these techniques, the INCITS



membership system which, after it was constructed was audited to have cost \$2.4 million through traditional techniques, actually only cost INCITS just over \$300,000.

- The Office of Personnel Management needed to manage the development of a Federal-wide HR database that would support agency HR data mapping, employee transfer, and OPM based HR analyses and reports. This version of the Metabase System was employed to create and cross reference all the data models associated with Federal Human Resources so that there could both be a consolidate HR model and cross walks to existing models.
- The Office of the CIO, U.S. Army needed to guide the development of the Army's Net Centric Data Management effort. It was also used to map the DoDAF, and to understand how to maximize the existing DISA Data Element and Defense Data Architecture repositories. This version of the Metabase System was employed to perform two tasks. The first was to operationally test the use of the Army's data management program data interoperability workshop as a way to validating policies and procedures. The second use was to then bring detailed specification to the collection of artifacts that had to be build across the Army to achieve enterprise-wide data interoperability.
- The U.S. Marshals Service was supported by a justice detainer information system (JDIS). This system had been constructed over a number of years. At the point where the JDIS database was about 400 tables, all its tables and columns were defined. However, many years later, when the JDIS database was over 1100 tables there were no table and column definitions. Once the 400 table and columns definition Microsoft Access database was discovered, the Metabase System was brought to bear, through specially written analysis and definition-assignment strategies to defined just about 90% of the 1100 database tables and columns.

2.0 Metabase System Return on Investment on a 1-Off Project

The Return on Investment (ROI) of efforts that use a Metabase System have always been positive even when the project on which it occurs is required to pay for the complete implementation and use of the Metabase System. The positive ROI occurs because the very refined engineering under which the Metabase System is constructed and refined automatically causes increased productivity, increased quality, decreased costs, and decreased risks. For example, in the Army's projects cited above, the costs per project without the Metabase System were costing the Army about \$500K per effort. Because of the Metabase System , the costs were reduced to about \$40 per project. The reductions were caused by enabling maximum reuse of specification and design artifacts across projects, and also the maximum reuse of software modules.



On the Social Security Administration project, process-centric techniques were initially used to create requirements and specifications. The project deliverables were considered unacceptable by the SSA. In the "remaining" time on the project, data centric techniques were substituted and a Metabase System was engineered and built. The SSA received and pronounced the deliverables a success. A follow-on contract was awarded.

In the INCITS project, an extensive on-line, client server system was created for an amount that was audited to be about 16% of cost of using traditional IT techniques. The engine's meta model was employed to guide the creation of requirements and specifications. The engine's method of code generation was employed to create the actual computer systems that supported the complete operation of the INCITS business.

In the Army CIO effort, the engine's design was employed to map to the DoDAF and the DoD Net Centric Data Goals. These were then show against traditional IT techniques to reduce the cost of systems specification and development by up to 75%.

3.0 Metabase System Return on Investment on COI-based Environments

The ROI derived from the use of a Metabase System on a collection of projects that reside in a community of interest will be significantly greater than from a single, 1-off project. Achieving that ROI will of course be more difficult as there will be a larger community of persons across whom consensus must be reached.

There are two strategies for creating data interoperability across a collection of Business Information Systems: Business Information System centric approach or the Communities of Interest.

Under the Business Information System centric approach, if two systems are to share data the technical teams of the respective Business Information Systems meet, and for every inter-system exchange, an information exchange specification is created. If there are 20 exchanges then there are 20 exchange specifications. Across 15 Business Information Systems, the maximum quantity of exchanges is 210. The cost for the specification and maintenance is over \$25 million. If the Data Interoperability Community of Interest approach is taken instead, the cost is about half, and the cost to add an additional Business Information System to the sphere of interoperability is about 10 times less. In short, using the Community of Interest approach and employing the Metabase System to develop, manage and evolve the collections of data interoperability artifacts is zero risk decision.

The Metabase System is engineered to promote levels of consensus such that the most detailed and specific data and process specification levels do not need to change. Rather they merely need to be mapped to the higher abstraction levels. This multiple level strategy allows the most detailed levels to maintain their own data names, data types, and even value domains just as long as they can all be mapped to the higher abstraction levels. Where they cannot be mapped then compromises must be made.



Immediate benefits accrue from a COI based Metabase System. These include being able to manage COI-wide IT project portfolios, greater reuse of data and process specifications, greater data interoperability and data sharing, easier and faster data exchange, and the like. While these are all possible within this project, and while the metadata Metabase System is already designed to facilitate distributed data entry, access, reporting and use, this specific project is intended to be precisely focused on the business problem of logistics transaction definition, mapping, and translation. Other and extended uses can flow from extensions to the domain of the effort.

4.0 Metabase System Return on Investment on Commonly Occurring, Enterprise-wide Environments

The Metabase System's database represents a large collection of Enterprise work products that are accomplished (or are supposed to be accomplished) 100% of the time.. Because these work products are commonly accomplished in an one-off manner, it is not uncommon for work products that are named differently to actually be the same, and work products that are named the same to be different in different ways. Both these unacceptable work product results end up with business information system and databases that are not integrated, not interoperable, and not non-redundant.

Because the Metabase System's databases consist of work products that are set within an accomplishment-methodology and business information system generator system, the resulting business information systems and databases are integrated, interoperable and non-redundant.

More importantly that those characteristics are the very significant ROI achieved as shown through the examples in previous sections. Set within typical problem-areas within enterprises, the following ROIs are possible to be achieved through the use of Whitemarsh products:

- Enterprise-wide Project Management -- 16 to 1 ROI
- Information Systems Planning -- 5.9 to 1 ROI
- Data-Centered Development and Management -- 28 to 1 ROI
- Data Model Manufacturing -- 8.6 to 1 ROI
- Business Information System Environments --- 7.7 to 1 ROI
- Business Information System Manufacturing -- 2.8 to 1 ROI
- Enterprise Architecture Development -- 14.6 to 1 ROI

These ROIs are described within the following section and subsections of:

<https://www.wiscorp.com/immediatereturnoninvestment.html>

