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*Data Management
Capability Maturity Model Assessment:
A Brief White Paper*

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Synopsis/Problem Statement: There is no clear, validated, and repeatable method and/or assessment strategy that can be used by projects, programs, communities of interest (COI) that span projects or programs that would determine whether a data management effort within a project, program, or COI conforms to well recognized data management goals, nor whether it exhibits data management strengths or weaknesses.

This process takes the extensive body of knowledge about Capability Maturity Models, Data Management environments, work products, methodologies and metrics, and combines and applies these to both measure data management quality and identify path ways to achieve greater level of quality within data management. This process employs a data management capability maturity model assessment instrument to assess their data management state and specifies pathway actions that need to be taken to both ensure that their data products conform to data management goals, and also exhibit, to the maximum degree practical, data management strengths.

This process is important and relevant as it clear needs a mechanism that can evaluate different projects, programs, and divisions for their compliance with data management goals. Currently, there is no available method for performing rigorous analyses to test this compliance. Further, if weaknesses or problem areas are found, there is no clear path to take in order to improve their data management practices and come into more complete compliance with data management goals.

Typically, the result of an organization's inability to measure itself and provide for improvement steps leads to difficulty in management and evolution. The relevant question is: "If you can't measure it, how can you manage it?" The symptoms of this situation are that an organization has difficulty replicating past success, it may have existing (unpublicized) standards that aren't followed, or that there is a problem with regard to accurate budgeting of costs.

In the data context, this results in a situation where projects run over-budget, take longer to implement than expected, and often provide less than 100% expected functionality. This process can produce a high rate of return because an undetected and/or faulty data management infrastructure can immediately cause a program to be halted and be suspended for several years at the cost of hundreds of millions while corrective data management actions are taken.

Fortunately, there is a data management capability maturity model assessment mechanism based on Carnegie Mellon University's Capability Maturity Model. This instrument provides a complete view of data management maturity.

The Data Management Capability Maturity Model (DM/CMM) instrument uses a 5-step assessment scale that is ideal for adaptation to organization- and area-specific assessment mechanisms, such as the present situation. The overall goal of the assessment is to determine whether an organization's data management efforts are at the (1) initial (ad hoc) level, (2) have repeatable expertise, (3) contain defined and documented processes and procedures, (4) provide



for management of those processes and procedures, or (5) make provisions for ongoing optimization of performance.

These assessments are important and relevant because without mature data management practices it will not be possible to deliver high quality, interoperable and sharable data. This assessment baselines existing data management practices so as to guide subsequent data management initiatives.

Poor quality data management practices cause reduced quality as the same fact may be named differently and/or be represented through different value domains, varying collection synchronizations, or have different granularity. There is decreased productivity because of the time and effort to resolve these problems, and because multiple and different processes have to be constructed to resolve the semantic conflicts. There is also increased cost both because of the previous two issues and also because business critical data degenerates through time thus causing lost opportunity for sales, income and reducing expenses and liabilities. Finally, there is increased risk because decisions, projections, and the like will be made with lessened confidence and clarity.

The scope of these data management assessments is broad in that it will result in the development of a data management evaluation process that can be used to assess various data management programs.

Both planned and existing initiatives will benefit from the assessment. The return on investment of this process accrues primarily due to the fact that the organizations will now possess verifiable information as to the quality of its various data management initiatives. This information can be used to focus specific subsequent investments to those areas/programs/practices that will result in the highest payoff.

The earlier the assessment is performed the greater the ROI because risks and poor data management practices will be identified earlier and fixed easier. It will result in immediate improvements in the quality of existing data management practices using a proven methodology that will result in improvements in the quality of data used by the enterprise.

Finally, breadth of this study applies to all classes of data, and is engineered such that the study can be repeated during the life cycle of a project/program to demonstrate progress and improvement.

Key Questions Answered: The key data management questions that are answered by this process include:

- What are the requirements for quality data management?
- How an existing DM/CMM instrument can be successfully mapped to data management goals?



- How a complete set of data products be identified within the artifacts of common systems development life cycles?
- Can applications of the DM/CMM assessment identify data management weaknesses within a project, program, or COI?
- Can remediation of the identified weaknesses cause a DM/CMM level to increase appropriately?
- Can the data management weaknesses be defined in terms of costs and resources, that when remediated produce a positive and measurable return on investment (ROI)?

Data: The data key within this process includes the existing Data Management Capability Maturity Model key process areas, and existing database project methodology, deliverables, metrics that have been proven over the past 25 years.

New data is collected from an enterprise with the application of the DM/CMM to an appropriate quantity of projects, programs, and COIs. This new data is correlated with existing data so as to predict weaknesses that then have to be independently verified, and any revisions to existing data management metrics that form the basis of remediation ROI. If necessary, the DM/CMM instrument is calibrated. Once calibrated it is applied once again to verify that the corrections have been successfully accomplished. The ultimately generated data identifies data management weaknesses that have to be addressed so as to successfully meet data management goals and that increase the data management strengths of the studied projects, programs, and COIs.

Significant Enterprise Benefits: The specific purpose of this effort is to enable projects, programs, and COIs to perform self-assessments and to take the necessary corrective action to ensure that their data management products are the necessary and sufficient set to then support the data management goals of the enterprise. The benefits will be immediate in that corrective measures can be taken well in advance of significant IT product rework that has proven to be so costly in the past.

The availability of an assessment for data management enables enterprise decision makers to understand the current status of data efforts, and to accurately budget for data costs taking into account the maturity level of the associated programs. From the perspective of individual programs, rather than simply knowing that something might be wrong, programs can understand exactly what the issue is, and what path exists to improve in that dimension. The proposal provides a migration path forward for data management.



Prototypical Project Plan (four staff weeks): The project plan includes the following:

- Identify enterprise data management goals.
- Map enterprise data management goals to the DM/CMM
- Identify projects, programs, and COIs involved in data management.
- Identify data management artifacts and map to both the DM/CMM, and data management goals
- Assess enterprise data management programs.
- Compare results with best-practice results, and create a path-way to improved data management quality.
- Implement path-way and conduct follow-up assessments to ensure improved data management quality.
- Quarterly Review for one year
- Annual (telephone) reassessment for two years

