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Management of the Master Data Methodology: A Framework for Analysis

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Abstract: This research paper introduces the need for the robust framework of methodologies in Master Data Management. MDM stands as an important aspect across corporate organizations toward the achievement of consistency, accuracy, and governance within an organization. The above objectives, as a result, are satisfied as the proposed framework endeavors to assess key components of MDM. These are data governance, data quality management, data integration, and data modeling. The work further investigates the challenges associated with the implementation of MDM and also tries to identify best practices toward successful deployment. The paper therefore attempts to provide actionable insights into the optimization of MDM strategies for improved data-driven decision-making and operational efficiency through a systematic analysis. The conceptual framework will be validated by case studies and practical examples in a variety of organizational settings.

Keywords: Data Governance, Data Quality, Data Integration

1. INTRODUCTION

In the modern context of data-driven organizations, effective master data management has positioned itself as a platform to which organizational achievements are linked. Master Data Management (MDM) is the most important strategy to ensure that critical information about key assets is available, complete and secure throughout the organization. This research article focuses on the urgent need for a quality framework in MDM to increase data reliability and improve decision-making processes. MDM projects are different from Data Integration or Data Quality projects. Data Integration or Data Quality projects are usually departmental in reach and address tactical problems like moving data from one system to another. MDM projects are wider is scope and Impact most of the enterprise systems. MDM projects are started for strategic reasons like increase revenue, reduced costs, improved customer service and achieving regulatory compliance. MDM projects will have stakeholders from both the business and the IT department. In fact, MDM projects are rarely successful if only one of these constituents are present. MDM will connect to many other systems, some internal to the enterprise, and some external like Dun & Bradstreet, Data Validation Services, Credit Bureaus, etc. Initially, the first MDM release will involve around 3 to 5 key systems, usually with one-way connections to send data to MDM. Each subsequent phase will add additional systems and possibly expand one-way connections to two-way connections, as systems adjust to accepting data from MDM. Eventually, many systems and users will be interacting with MDM.

2. LITERATURE SURVEY

[1] MDM improves data quality, reduces operating costs and increases efficiency by maintaining accurate and secure data. It helps organizations comply with regulations and reduce the risk of data breaches. This article highlights the critical role of MDM for businesses of all sizes. Using MDM services can increase efficiency and effectiveness. [2] This article reviews methods for identifying MDM issues and provides a framework for successful MDM. The framework includes planning, implementation and evaluation steps. Identify critical success factors to support decision making and needs analysis. The aim is to develop an effective approach to MDM. [3] NoSQL databases solve the scalability and flexibility challenges of social media profile management within an MDM framework. This article examines how NoSQL solutions can improve performance and data quality. It includes an overview of different NoSQL technologies and their benefits. Practical implications and potential issues regarding NoSQL adoption in MDM are discussed. [4] This research focuses on creating the “golden print” of knowledge organization through knowledge management. One is providing the knowledge used to create the truth of the truth. Challenges include data integration, standardization, and consistency across departments. Effective MDM reduces errors and increases data reliability, leading to business success. [5]This article highlights the benefits of MDM in improving data consistency, completeness, and accuracy within an organization. MDM connects many functions to provide a foundation for business success. Addresses data governance and liability issues. The right MDM can reduce compliance risk and improve overall company performance. [6] The MDM model begins with defining the organization's MDM vision aligned with its business goals. The six-step process includes core data definition, data governance, data cleaning, lifecycle management, MDM architecture, and training. Effective data governance ensures compliance and alignment between IT and business. The model fosters a common understanding of master data across the organization. [7] This study evaluates various MDM integration methods to improve knowledge management in an organization. It provides a good and versatile method to evaluate your results. This study shows positive results such as improving the quality of information and decision making. Strategic guidance and global standards demonstrate the importance of MDM integration for business success. [8] This article presents a framework for managing complex data in a

dynamic environment. Includes study design, project management, stakeholder collaboration, data analysis, and quality assurance. The EMDF framework helps solve the complexity of data management. Thoughtful and thought-provoking ideas on each topic stimulate understanding and application. [9] Creating an MDM system involves creating a single, reliable database from a variety of internal and external sources. This process includes data extraction, collaboration, and optimization. Key issues include managing shared information and ensuring consistency across departments. Effective MDM supports accurate reporting and reduces errors and challenges. [10] This article describes how to set up a master data management system (MDMS) to store master data in enterprise software. The application, developed by Fail-Safe IT Solutions Oy, uses a gitbased solution for data integration. The development process includes repeatable testing and pseudocode analysis. MDMS is designed to improve data storage, distribution and integration. [11] Master data identifies important business objects such as customers and products. Organizations often face inconsistent data across multiple applications. The integrated master profile manages relationships between customers, sales, marketing and service. As reported by Asea Brown Boveri (ABB), solutions from vendors such as SAP and Oracle help distribute master data and support new service processes.

3. METHODOLOGY

Implementation Methodology:

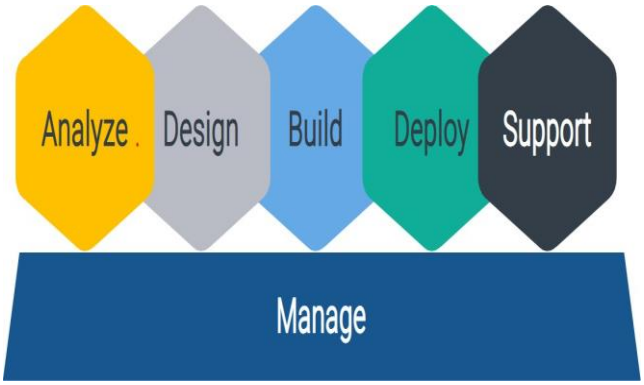

Fig-1: Implementation phases

1. Manage:

Activities: Some of the Manage Phase activities must be done at a high level for the entire MDM journey, as well as defined in more detail for each particular release. The vision, scope and business case for the MDM journey is important to lay the framework for all the releases. Each release needs its own vision, scope and business case, to ensure each release delivers tangible value. A project plan for the release will help to manage all the aspects of the project - resource assignments, due dates, reviews, deliverables, etc. At the end of the release, the project close activity will get customer signoff and ensure a smooth turnover to the support team.

Roles: The key roles for the manage phase include the sponsors-the Project Business Sponsor should be a C- level person from the client's business functions and the Project Technology Sponsor should be a senior person from the client's I.T. area. The Data Governance Manager and Technical Project Manager are client resources under the organizations of the sponsors. The Project Manager and Technical Architects should have prior Informatica MDM implementation experiance, so these are likely from Informatica or the Implementation partner.

Deliverables & Tools: Deliverables are what you'd expect from the Manage Phase - project plan & milestones, scope, risk assessment, status reports, etc. For tools, there are sample MDM project plans out in the Velocity site which you should use as the foundation for your plan.

2. Analyze:

Activity: The Analyze phase is when the project team starts to document all the requirements the business and IT staff have for the MDM environment for this release. A thorough Data Profiling and Assessment of targeted sources will discover the details and characteristics of the data in scope. Examining the data stewardship process will uncover the functions that MDM needs to support. The architect will start to outline the solution, including the logical data model. As more information is learned, high level requirements are clarified into detail requirements.

Roles: The roles involved in the Analyze phase are listed here. The experienced architects from the implementer should define the MDM solution and review that with the client's architects. Adjustments may be needed, to meet client standards. In some cases, exception variances may be needed from the client architects, to allow MDM to operate most efficiently. It should be a team effort between client and implementer architects to architect the solution. Business Subject Matter Experts (SME) will work with Data Analysts and ETL specialists to identify the strategy to get source data moved into MDM. The Data Base Administrator and Application Server Administrator are client personnel who will help establish the physical MDM environments for developing, testing and production.

Deliverables & Tools: The Requirements Specification is the main deliverable and includes a logical data model. All of the activities should have been uncovering requirements to document as specifications. Whether one large document or a series of document the specifications set the scope for what moves to the Design phase. The Data Profile Assessment would have produced a lot of specifications, but it also might have uncovered items that need to be fixed in the source system before loading into MDM. Those items will be documented in the Data Quality Audit.

3. Design

Activity: The Design phase is concerned with translating the requirements of the Analyze phase into concrete designs that can be implemented and tested in the Build phase. It includes finalizing the Solution Architecture, converting the logical data model to a physical one, and designing the interfaces from both the user and system perspectives. Roles: Design phase is when the people doing the work in the Build phase start to plan their components. Understanding the requirements and figuring out how to deliver that functionality

is the goal for each person. Those designs will be reviewed by the architects and analysts to make sure everyone is working towards the correct results. While client resources can be involved, it is recommend that they shadow and assist an experienced resource, particularly for the MDM specific roles like MDM Configuration Specialist and User Interface Designer. Deliverables & Tools: The Technical Solution Architecture details the solution. It should include interface specifications between MDM and other systems, like source to target mappings from the source system tables to MDM tables or Customer360 SaaS entities. The MDM Hub Technical Design Specification should be done as a high level draft only, at this point. Much of the detailed specifications can be generated from the configuration in the Hub after the Build is complete. Do not spend time documenting in detail what should be built, since it is better to include the details of what was actually built. Actual field layouts are better to document with screen prints once the build is complete. It is easier for developers to work with users during the build to refine the layouts than to envision the best layout from theory.

4. Build

Activities: The Build phase is concerned with configuring the MDM physical data model in either MDM MDE or Customer360 SaaS and developing any ETL and custom code. It includes implementing the data model and rules from the Design phase into the MDM environment, tuning the processes and rules, Developing interfaces between MDM and the source and target systems, system testing and user acceptance testing.

Roles: Those who participated in designing what would be built are now executing that during the Build phase. New roles would be additional testers and data stewards to participate in the test and review activities. Also, members of the client's IT support team should be involved with code reviews and testing, as a way of transferring knowledge from the project team to the support team.

Deliverables & Tools: The main deliverable is a configured hub and all other mapping and interface code.Test plans, scripts and results would be documented. Finally, extracted documentation from the MDM configuration should be used to update the design documents.

5. Deploy

Activities: This phase is concerned with moving the system into production. It includes setting up the production environment and deploying the code to it. Loading the initial data sources and completing the consolidation activities is usually part of the "Deploy", although some argue that is part of Support. Finally, wrapping up the project and handing the system over to the appropriate system support team is part of Deploy. Make sure the client's system support team knows how to engage with Informatica Support. Also let Informatica Support know that your system is live and who the client support team contacts are.

Roles: People like the IT Support Manager and Specialists, who will be maintaining the system once it is running in production, should be key resources in the Deploy phase. Trainers might also be needed to train additional users who were not involved during the implementation project. This would include MDM product training as well as client business operations regarding how to use MDM.

Deliverables & Tools: A working system is the main deliverable. Of course, there are documents regarding the operation and maintenance of the system which need to be created for the support personnel.

6. Manage

Activities: Once in the Support phase, the client's IT staff will need to monitor the load jobs, investigate and resolve system issues and ensure that maintenance activities like database backups occur. Someone will also have to manage user access to MDM and create new IDs when authorized.

Roles: Key project resources will still be available for a few weeks in this phase to ensure a smooth transition to the support staff. Eventually, the IT Support Team and the Data Stewards will be the only roles.

Deliverables & Tools: There are no deliverables for this phase. Each client will have their own documents and processing for handling a production application.

4. CONCLUSION

In summary, data management (MDM) is vital for today's organizations looking to improve data integrity across operations. MDM supports strategic goals such as revenue growth, cost reduction, customer and compliance by providing and securing information about critical assets across the organization. Collaboration between business and IT stakeholders is critical to successful MDM and helps MDM evolve from an integration to a comprehensive approach that connects disparate products inside and out. As MDM matures, it becomes a key driver of data trust and enterprise agility, critical to informed decision making and maintaining competitive advantage in today's information-centric environment.

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