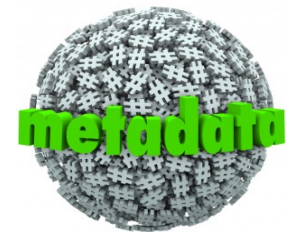


A Successful Meta-Data Repository (MDR) - It's About Managing Relationships

Phil Giangliulio &
Melanie Paules
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Objective for Today

A Fundamental Understanding of:

- MDR Expectations
- Metadata Relationship Types & Constructs
- Relationship Management / Sharing

Questions

Key MDR Expectations



Compliance with CDISC standards and regulatory agency requirements – by keeping company global standards current and managing study specification conformance



Achieve the highest quality clinical trial data and analyses – through well formed metadata and traceability



Reduce time and complexity required to gather and analyse clinical trial data – through data standards reuse and metadata driven data transformations in clinical systems

MDR Delivering Value

Wikipedia's Metadata Repository "Reasons for Use" currently stand as follows:

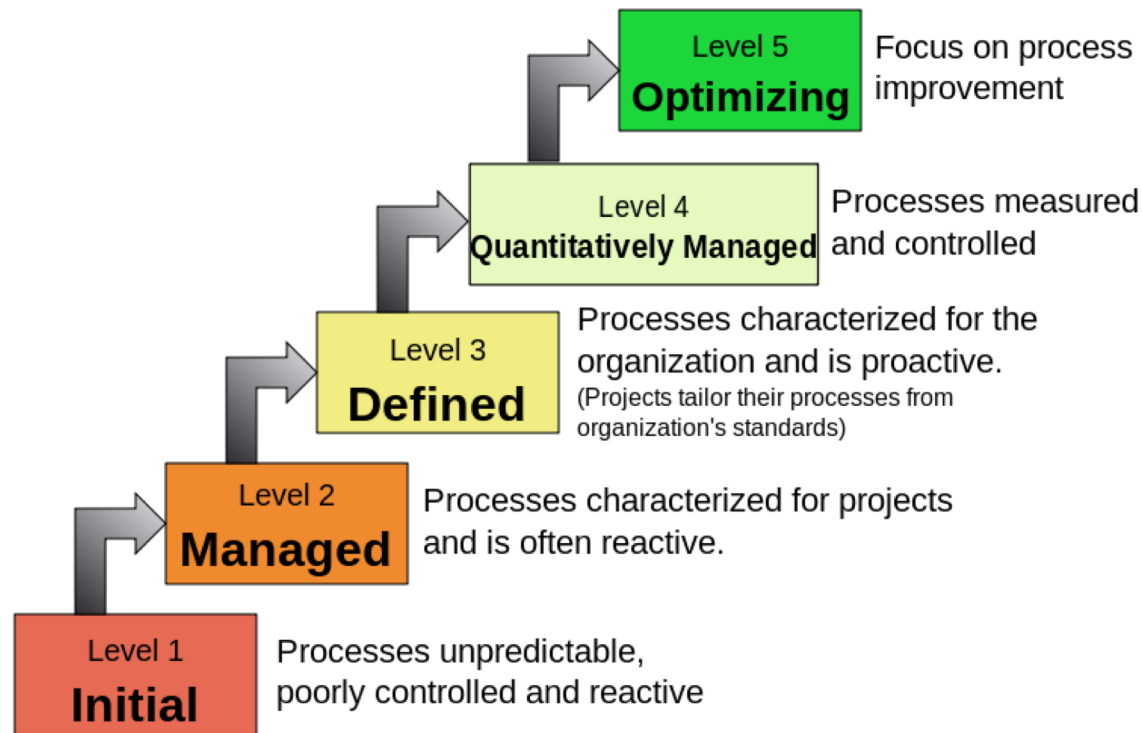
- 1. Integration of the metadata across the organization**
- 2. Build relationship between various metadata types**
- 3. Build relationship between various disparate systems**
4. Define business golden copy of definitions.
5. Version control of the changes at structure level
6. Interaction with Reference data
7. Link view to master data.
8. Automatic synchronization with various authorized metadata source systems.
- 9. More control to business decisions**
10. Validate the structures by overlapping the models
11. Discovering discrepancies, gaps, lineage, metrics at data structure level

* Metadata repository (From Wikipedia, the free encyclopedia) https://en.wikipedia.org/wiki/Metadata_repository

Key MDR Expectations

Clinical Trial Processes can be categorized by Capability Maturity Levels

Characteristics of the Maturity levels

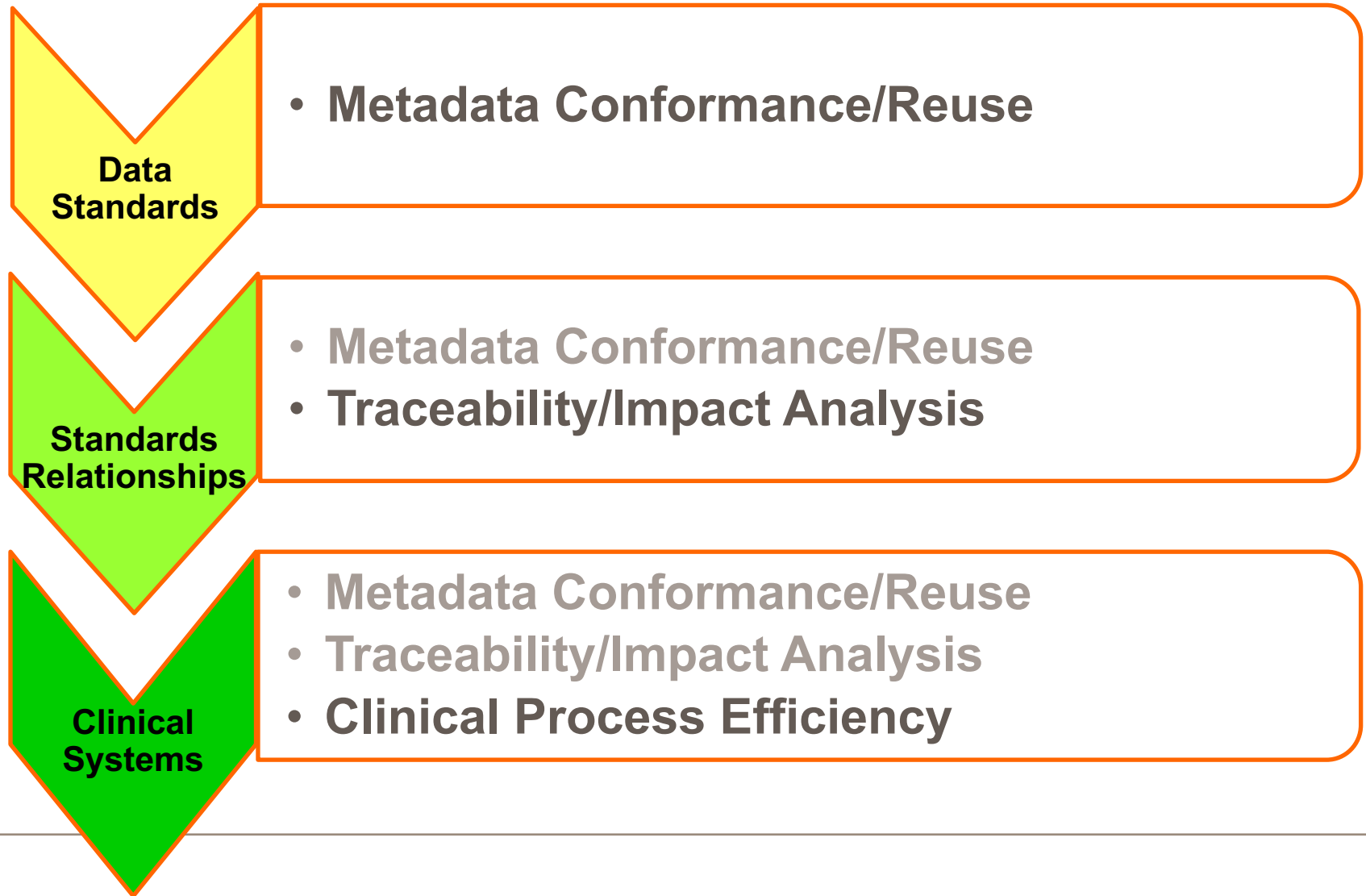


* Characteristics of Capability Maturity Model (From Wikimedia Commons, the free media repository)

https://commons.wikimedia.org/wiki/File:Characteristics_of_Capability_Maturity_Model.svg

A Successful MDR – It's about Managing Relationships

MDR Delivering Value



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Metadata Relationship Types



➤ Versioning

- ✓ The ability to identify a specific version of any MDR object (including codes, code lists, variables, data sets and mapping relationships), at any timepoint, of the organizational standards and an individual study specification is critical.

➤ Inheritance

- ✓ Can be considered as vertical relationships
- ✓ Consists of Child/Parent relationships from study to organization to CDISC.
- ✓ Supports compliance management and impact analysis (e.g. version upgrades)

➤ Beginning To End (B2E) Traceability

- ✓ Can be considered as horizontal relationships
 - ✓ Traces clinical data through a study lifecycle from acquisition to tabulation to analysis
 - ✓ Utilizes source to target Standards Mappings (e.g. CDASH to SDTM, SDTM to ADaM, ADaM to ARM)
 - ✓ Supports impact analysis of standards and study specification changes
-

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Metadata Constructs



➤ Standards Mapping

- ✓ Captures relationships required for B2E traceability
- ✓ Contains the specifications for clinical system data transformations
- ✓ Both Set Level and Element Level Transformations are needed.
- ✓ Currently, no industry-defined standard exists

➤ Clinical Content / Value Level Metadata

- ✓ Provides the association or grouping of interdependent clinical data
- ✓ Contains characteristics, attributes or content that are dependent on specific values. (e.g. __TESTCD values for findings domains)
- ✓ Can be leveraged to ensure data consistency B2E across standards models (Ensures data is reported as collected)

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Standards Mapping Example



Target Model	Target Set	Target Element	Source Model	Source Set	Source Element	Transform Level	Transform Name	Transform Item	Transform Order	Set Operation	Set Selection	Set Condition	Set Element Selection
SDTM	SDTM.AE		DRM	Review.AE		Set	SDTM_AE	BASE	FIRST		Review.AE		*
SDTM	SDTM.AE		DRM	Review.DM		Set	SDTM_AE	DM_JOIN	...	LEFT JOIN	SDTM_AE.BASE AS A <OPERATION> Review.DM AS B	A.USUBJID EQ B.USUBJID	A.*, B.REFSTRDT, B.REFENDDT
SDTM	SDTM.AE		DRM	Reference.MEDDRA		Set	SDTM_AE	MEDDRA_JOIN	...	LEFT JOIN	SDTM_AE.BASE AS A <OPERATION> Reference.MEDDRA AS B	A.AELLTCD EQ B.AELLTCD AND B.AEPATHCD EQ '1' AND B.AENC EQ 'C' AND B.AEVER EQ <VERSION>	A.*, B.AELLT, B.AEPTCD, B.AEPT, B.AESOCDD, B.AESOC, B.HLGTCD, B.HLGT, B.HLTCD, B.HLT, B.AEVER
SDTM	SDTM.AE		DRM	Review.SE		Set	SDTM_AE	SE_JOIN	LAST	...	...	...	...
SDTM	SDTM.AE	AETERM	...	SDTM_AE.BASE	AETERM	Element	DIRECT_MAP						
SDTM	SDTM.AE	AESTDTC	...	SDTM_AE.BASE	AESTDTC_DT	Element	ISO_MAKE_DTC						
SDTM	SDTM.AE	AESTDY	...	SDTM_AE.DM_JOIN	AESTDTC_DT	Element	CALC_STDY						
SDTM	SDTM.AE	AESTDY	...	SDTM_AE.DM_JOIN	RFSTDTC	Element	CALC_STDY						
SDTM	SDTM.AE	AELLT	...	SDTM_AE.MEDDRA_JOIN	AELLT	Element	DIRECT_MAP						
SDTM	SDTM.AE	AEPT	...	SDTM_AE.MEDDRA_JOIN	AEPT	Element	DIRECT_MAP						

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Clinical Content / Value Level Metadata Example



Content Category	Content Set	Content Item	Code List	Code	Assigned Value	Element Transform	VLM
VSTESTCD	BMI	...	...	...	...	...	...
VSTESTCD	BSA	...	...	...	...	...	...
VSTESTCD	DIABP	...	...	...	...	...	...
VSTESTCD	SYSBP	SYSBP_TESTCD	VSTESTCD	SYSBP		ASSIGN_CODE	Y
VSTESTCD	SYSBP	SYSBP_TEST	VSTEST	Systolic Blood Pressure		ASSIGN_CODE	Y
VSTESTCD	SYSBP	SYSBP_ORRES				DIRECT_MAP	Y
VSTESTCD	SYSBP	SYSBP_ORRESU	VSRESU	mmHg		ASSIGN_CODE	Y
VSTESTCD	SYSBP	SYSBP_STRESN				CONV_TO_STD	Y
VSTESTCD	SYSBP	SYSBP_STRESU	VSRESU	Pa		ASSIGN_CODE	Y
VSTESTCD	SYSBP	SYSBP_POS	POSITION_VS			LOOKUP_DECODE	Y
VSTESTCD	RESP	...	...	...	...	...	...
VSTESTCD	TEMP	...	...	...	...	...	...

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Relationship Management / Sharing



➤ Standards Governance

- ✓ Begins as soon as MDR is populated and goes live
- ✓ Complete B2E data standards for all new standards and updates
- ✓ Include resolution mechanism for conflicts if/when they should arise

➤ Global to Study Metadata Sharing

- ✓ Initial study build inherits organizational standard specifications
- ✓ Compliance monitoring of final study specifications ensure that deviations are truly study specific
- ✓ Standards compliance is crucial in enabling meaningful process efficiency

➤ MDR to Clinical System Sharing

- ✓ Final link in completing the process efficiency chain
- ✓ Includes communication of standard source and target set and element specifications
- ✓ Includes communication of standards mapping as specifications for actual operation system target transformations
- ✓ Requires mechanism to request and condition metadata for consumption by a clinical system

A Successful MDR – It's about Managing Relationships Risk Mitigation



Some risks to consider in implementing a successful MDR

- Unclear roles and processes for Standards Governance
 - ✓ Maintenance and up-versioning
 - ✓ Conflict resolution
- Incomplete Standards
 - ✓ Gaps in Standards and Standards Mapping
 - ✓ Non-harmonized (B2E) Standards
- Weak/Ineffectual compliance monitoring
- Unclear delineation of standards vs clinical system, operational metadata
- No mechanism for effective metadata sharing.



Conclusions

- Building a well formed MDR is only the first step in cultivating its success.
- Effective management of the standards it holds, and compliance to them, adds to its value.
- An MDR that defines mappings between standards and effectively communicates those mapping definitions to clinical systems, can drive significant efficiency that lower clinical study timings and cost.
- **Building and leveraging the type of relationships discussed above is the key to ensuring your MDR's success.**

Questions

