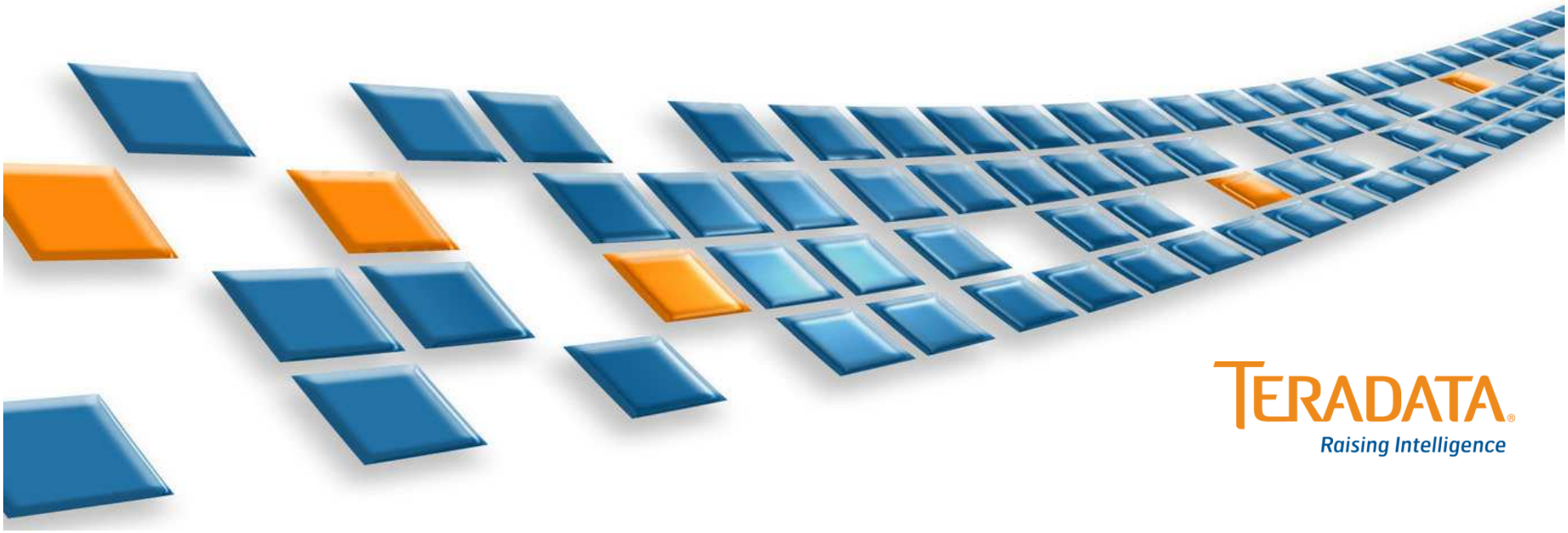
Enterprise Data Management (EDM)

What are the components and how do they work together?

TDWI Denver Chapter Meeting – Oct 2010

Lance Miller

VP, Global Services Marketing



TERADATA
Raising Intelligence

Gartner Predictions

Gartner Predicts 2009

50% Organizations that increase investments in information management will reduce data costs by 50%

Information assets will appear on the balance sheets of 25% of Global 2000 companies **25%**

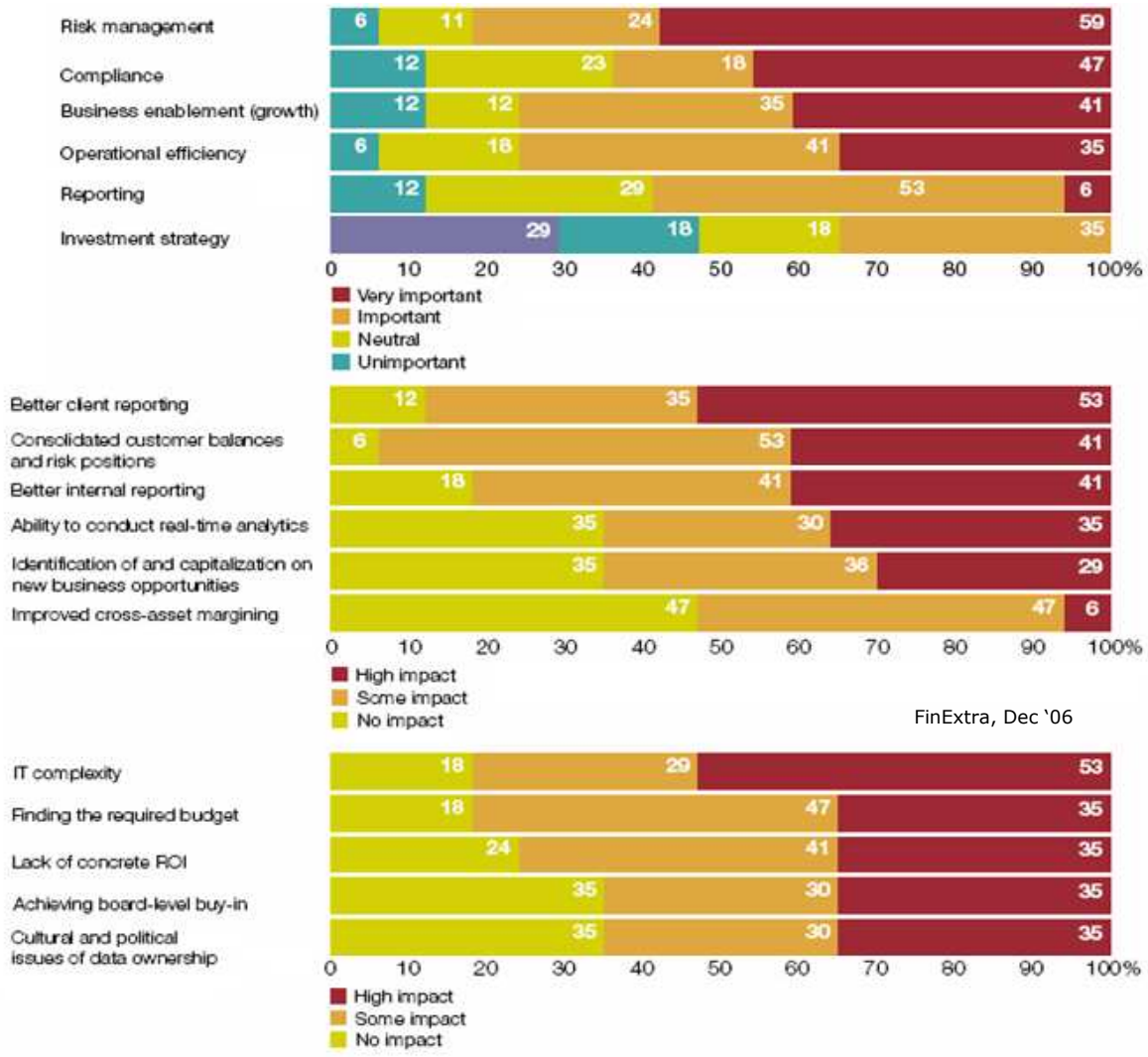
2x Companies adopting enterprise information/data management will be able to reduce operational costs two times faster than competitors

75% of global organizations will have a formal enterprise data/information management team composed of IT and business resources **75%**

40% Companies that successfully manage their IT investments generate returns that are 40+% higher than competitors

Business Drivers

- Reasons for EDM
  - > Risk
  - > Compliance
  - > Growth
  - > Efficiency
  - > Reporting
- Expected benefits
  - > Reporting
  - > Customer Info
  - > Risk Management
  - > Real-time Analytics
- Obstacles to achieving benefits
  - > IT Complexity
  - > Budget
  - > ROI
  - > Buy-in



EDM Plays Role in Top Initiatives

Top Business Priorities, as Selected by CIOs

Business Expectations

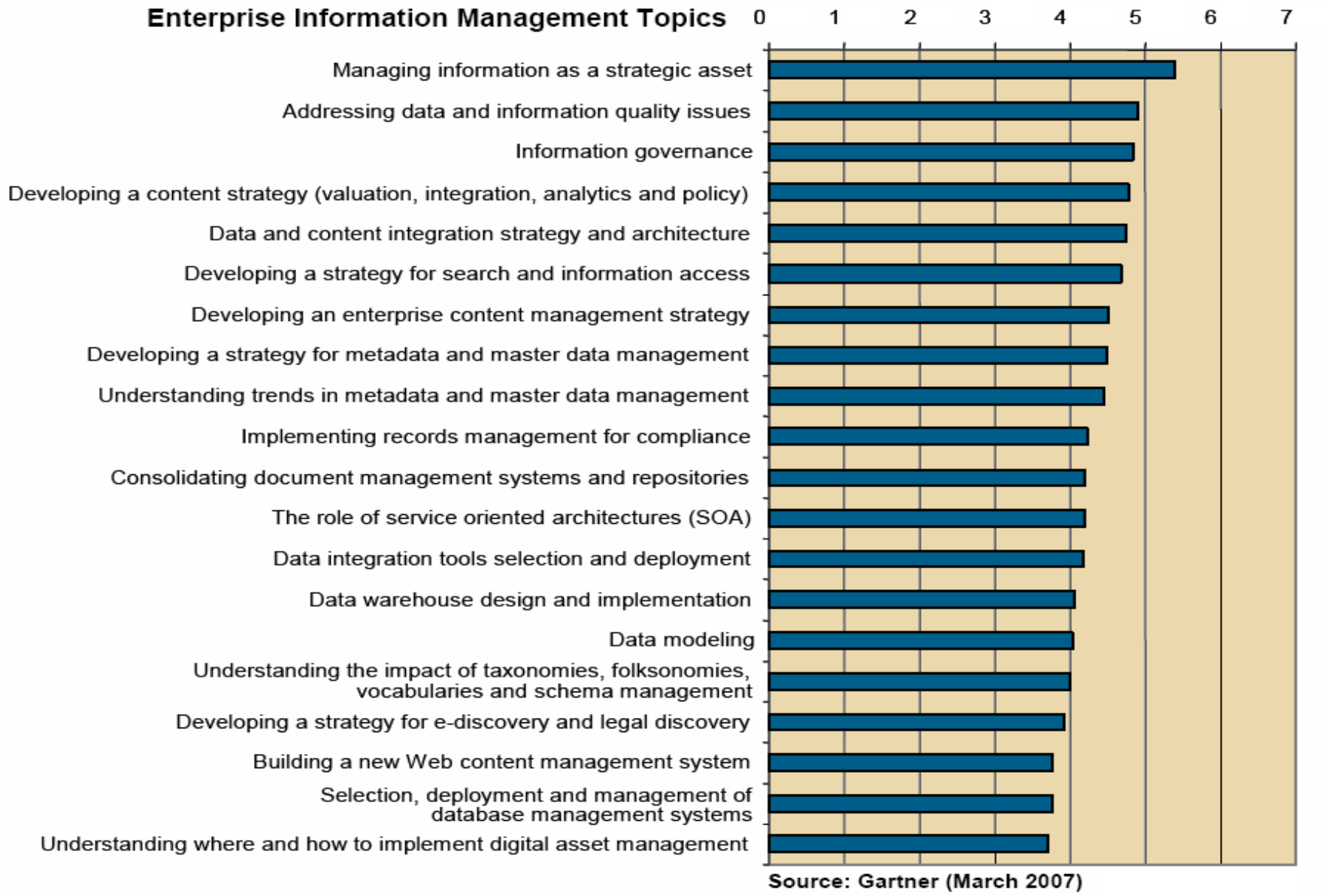
Ranking of business priorities CIOs selected as one of their top five priorities in 2009.

Ranking	*2009*		2008	2007	2006	*2012*
Improving business processes	1	⟷	1	1	1	2
Reducing enterprise costs	2	↑	5	2	2	7
Improving enterprise workforce effectiveness	3	↑	6	4	*	6
Attracting and retaining new customers	4	↓	2	3	3	3
Increasing the use of information/analytics	5	↑	8	7	6	8
Creating new products or services (innovation)	6	↓	3	10	9	1
Targeting customers and markets more effectively	7	↑	9	*	*	9
Managing change initiatives	8	↑	12	*	*	12
Expanding current customer relationships	9	↓	7	*	*	11
Expanding into new markets or geographies	10	↓	4	9	*	4
Consolidating business operations	11	↑	13	14	*	15
Supporting regulation, reporting and compliance	12	↑	14	13	*	16
Creating new sources of competitive advantage	13	↓	11	8	*	5

*** Item not included this year**

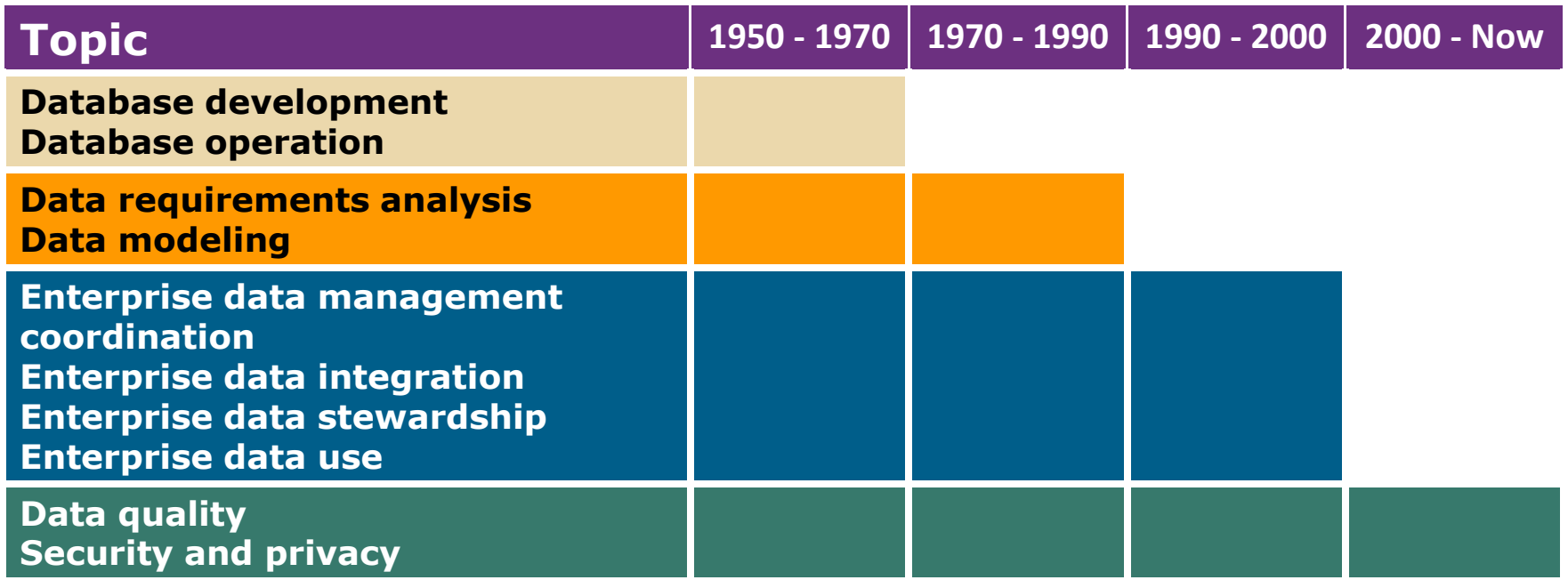
Source: Gartner (July 2009)

Scope of Enterprise Data Management



History of Data Management

- EDM has been with us for a long time
- More sub-topics likely

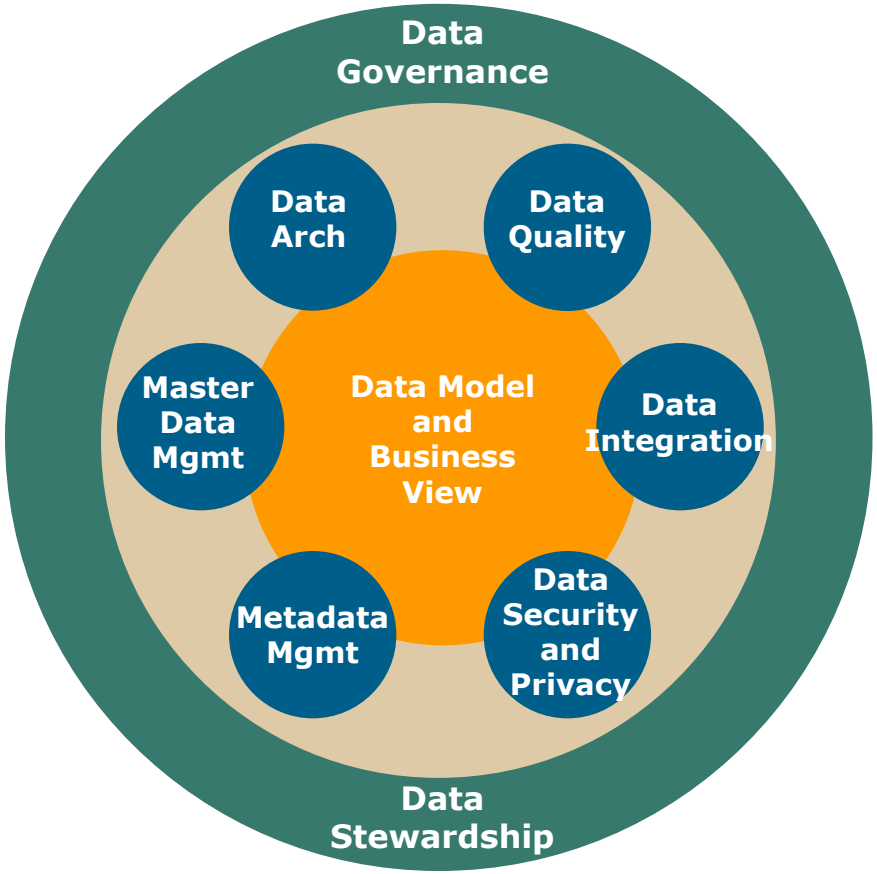


Enterprise Data Management Defined

- Integrated disciplines for structuring, describing and governing information assets
- Tasks for creation, use, storage, documentation and dissemination of data across the enterprise
- Processes spanning organizational and technological boundaries
- Management of data as an enterprise asset across entire company
- To improve operational efficiency, promote transparency and enable business insight

EDM Overview
Trusted and Integrated Data

- **Data Governance** – The practice of organizing and implementing principles, policies, procedures and standards for the effective use of data
- **Data Stewardship** - Continual, day-to-day activities of creating, using, and retiring data
- **Data Quality** – Ensure data is fit for its intended use
- **Data Integration** – Includes Data Acquisition (ETL/ELT) processing to combine transaction and master data to provide a consistent, meaningful, and trusted view of the data across business units and subject areas
- **Data Security and Privacy** – Information security, data privacy and regulatory compliance across data subject areas, including monitoring and audit capabilities
- **Metadata Management** – The people, processes and technical components necessary to ensure that metadata is easily accessible, consistent, current, accurate, timely and complete
- **Master Data Management** – Focus on reference and relationship data for product, customer, supplier and organizational data to ensure data consistency
- **Data Architecture** – The logical and physical data modeling plus other activities needed to understand business information needs and design for effective database usage
- **Data Model and Business Views** - The structure for integrated and trusted data

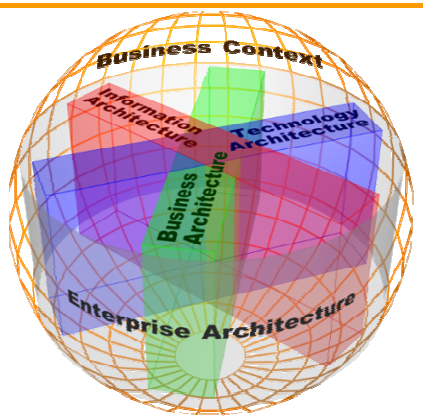


People, Processes, and Technology

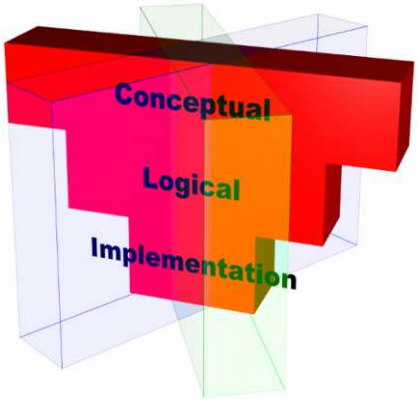
Enterprise Architecture

Data Arch

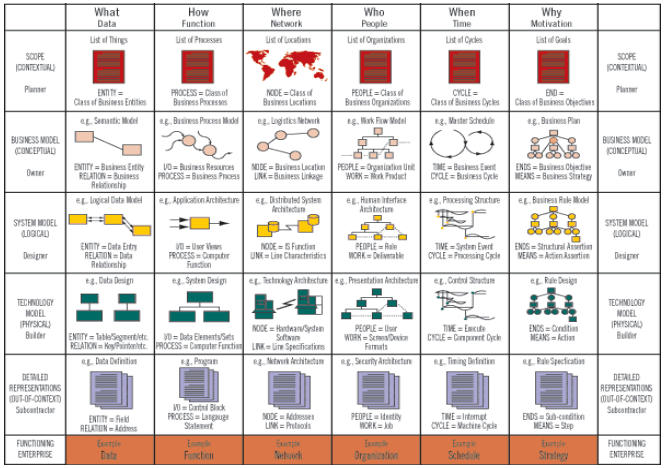
- Enterprise Architecture defines information principles, technologies and models that link business / technology architecture
- Where Data is Created, Read, Updated, Deleted
- Enterprise Data Management implements the Enterprise Architecture



EA Framework



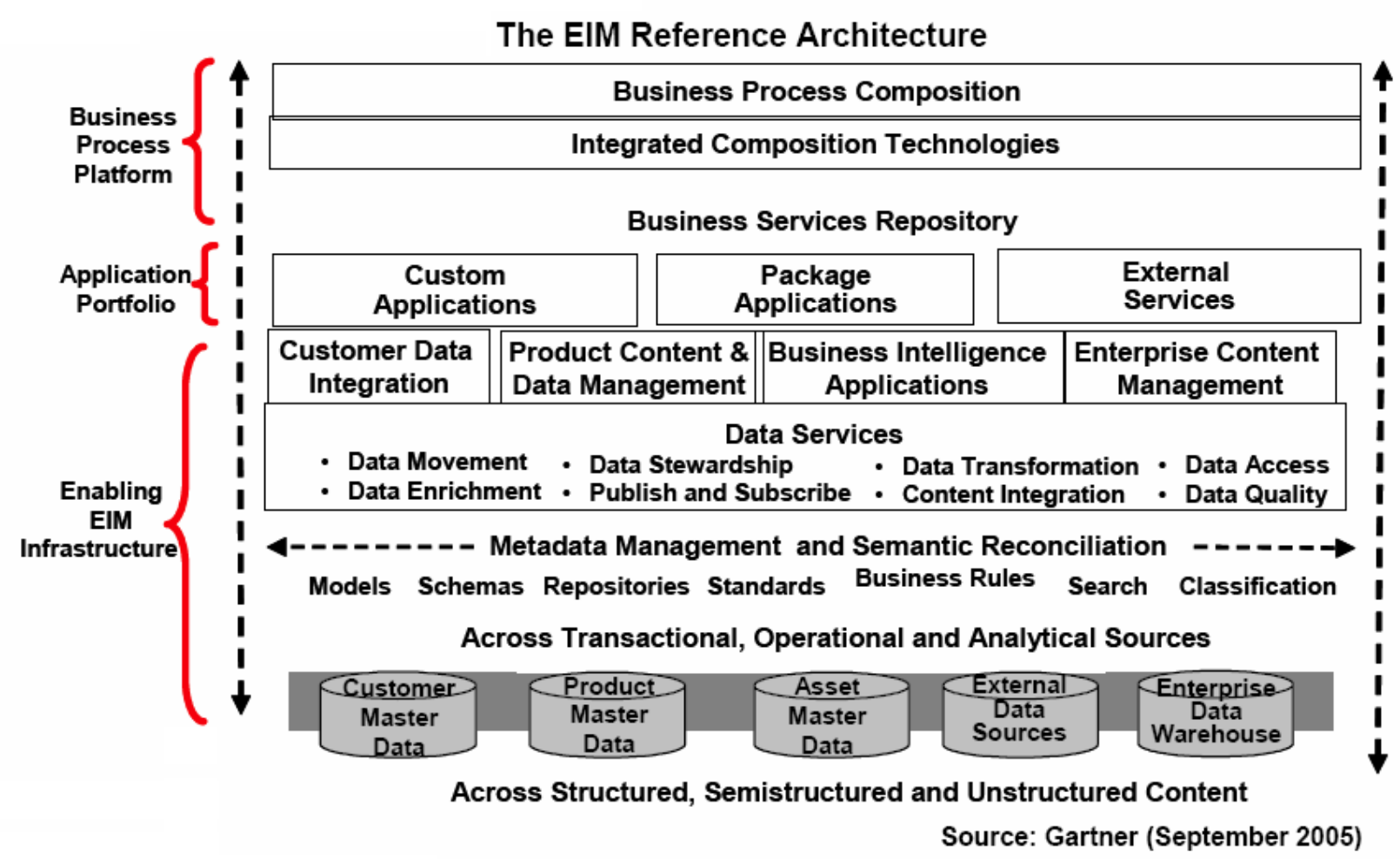
Detailed Views



Zachman Framework ®

EDM Reference Architecture

- Gartner view of EDM

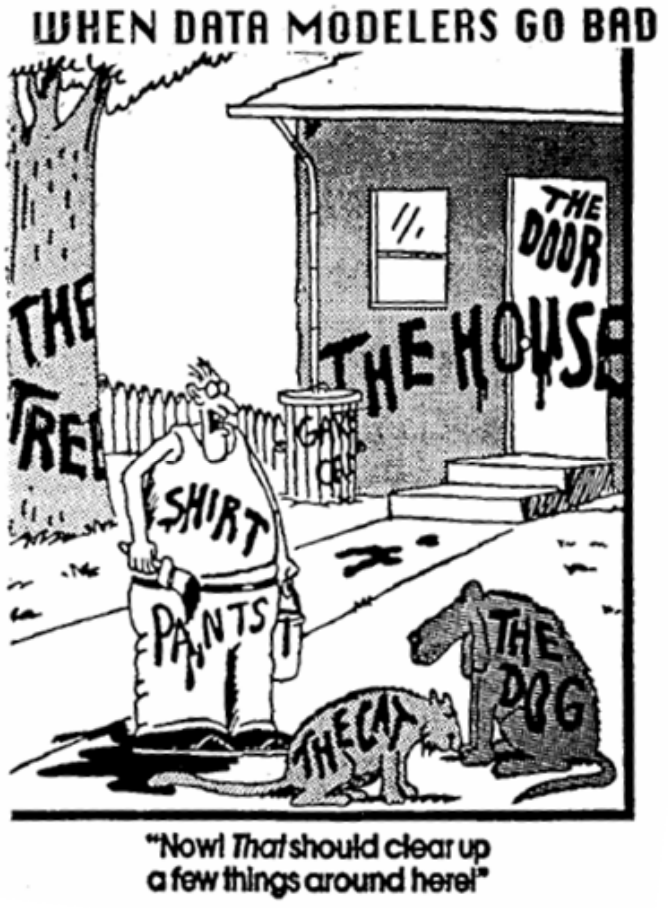


How Does This Relate to Data Models?

Data Model and Business View

De-mystify Data Models

- Watch for Jargon / Complexity
- Model of business information
  - > Enterprise data structure & how to populate
  - > Method to increase understanding
  - > Definition of how data interrelates
  - > Plan for IT staff to build systems for business users
  - > Model enterprise to find growth roadmap
- Simple concept / some complexity
  - > **Visually communicate**
  - > **Information framework**
  - > **Foundation** for DW



(Inter)Relationships / Hierarchy

Data Governance

Strategic Planning, Operations, Financials, Risk Management, Management

Enterprise Governance

IT Governance

Data Management

DW Governance

Data Architecture

Data Governance

Data Quality

IT Value

IT Projects

What if the hierarchy is inverted?

Prioritization/Funding Methods

- Strategic / Tactical Value
- Economic Value
- Size / Scope / Impact
- Time-to-value / time-to-complete
- Ability to execute / degree of difficulty
- Readiness to adopt
- Frequency / Complexity / Sophistication

Idea Generation

Opportunity Assessment & Prioritization

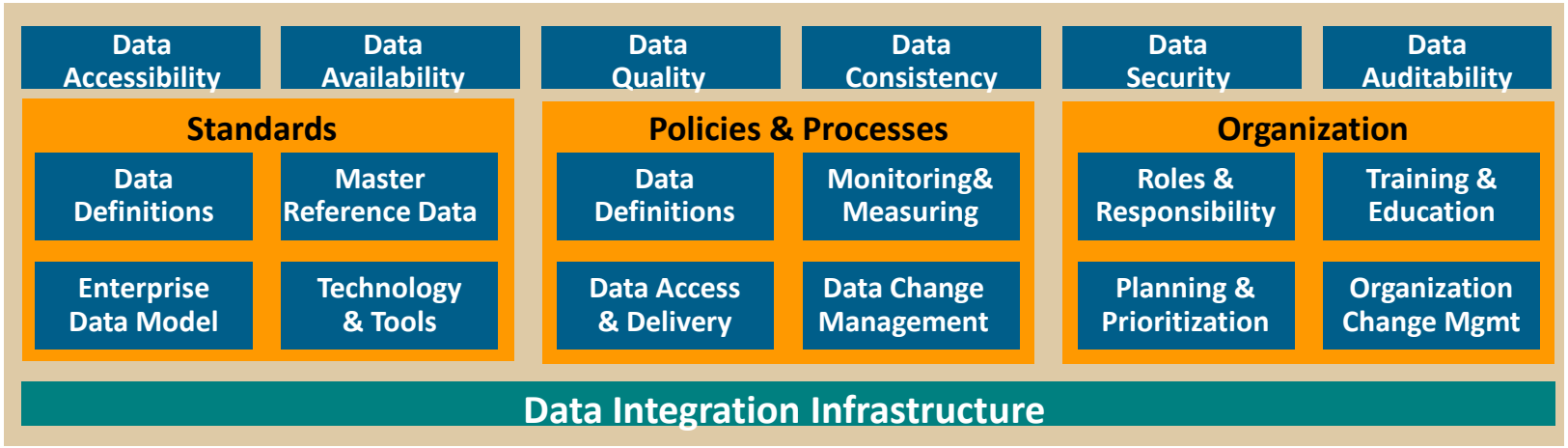
Project Implementation

System Management

Data Governance Functions

- Policies / Business Rules
- Risk Management
- Stewardship / Owners
- Security / Privacy / Compliance
- Governing Body / Organization
- Update, Re-fresh Rate
- Metrics / Management

Access / Usage
Quality / Integrity
Completeness
Availability
Accuracy / Consistency
Audit / Controls

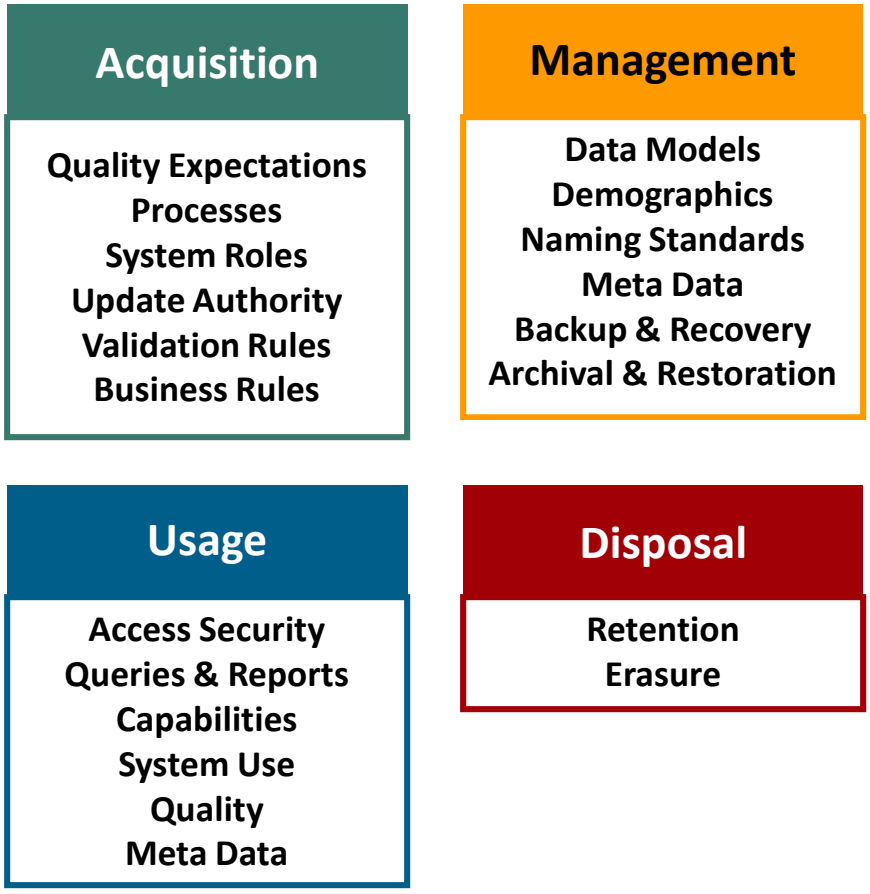


Stewardship – The Domesday Book

- Winter 1085 – William I of England (aka William the Conqueror) announced plans to survey the English possessions / stewards conquered in 1066 … the survey became known as "Domesdai"

Data Stewardship Roles / Responsibilities

- Stewards (Not Owners) and Influencers
- Define business data elements / domain values
- Establish and validate data quality rules
- Identify and help resolve data quality issues
- Develop data domain rules for data domains
- Define security requirements



Data Stewardship Matrix

Using either Subject Area / Business Area Approach

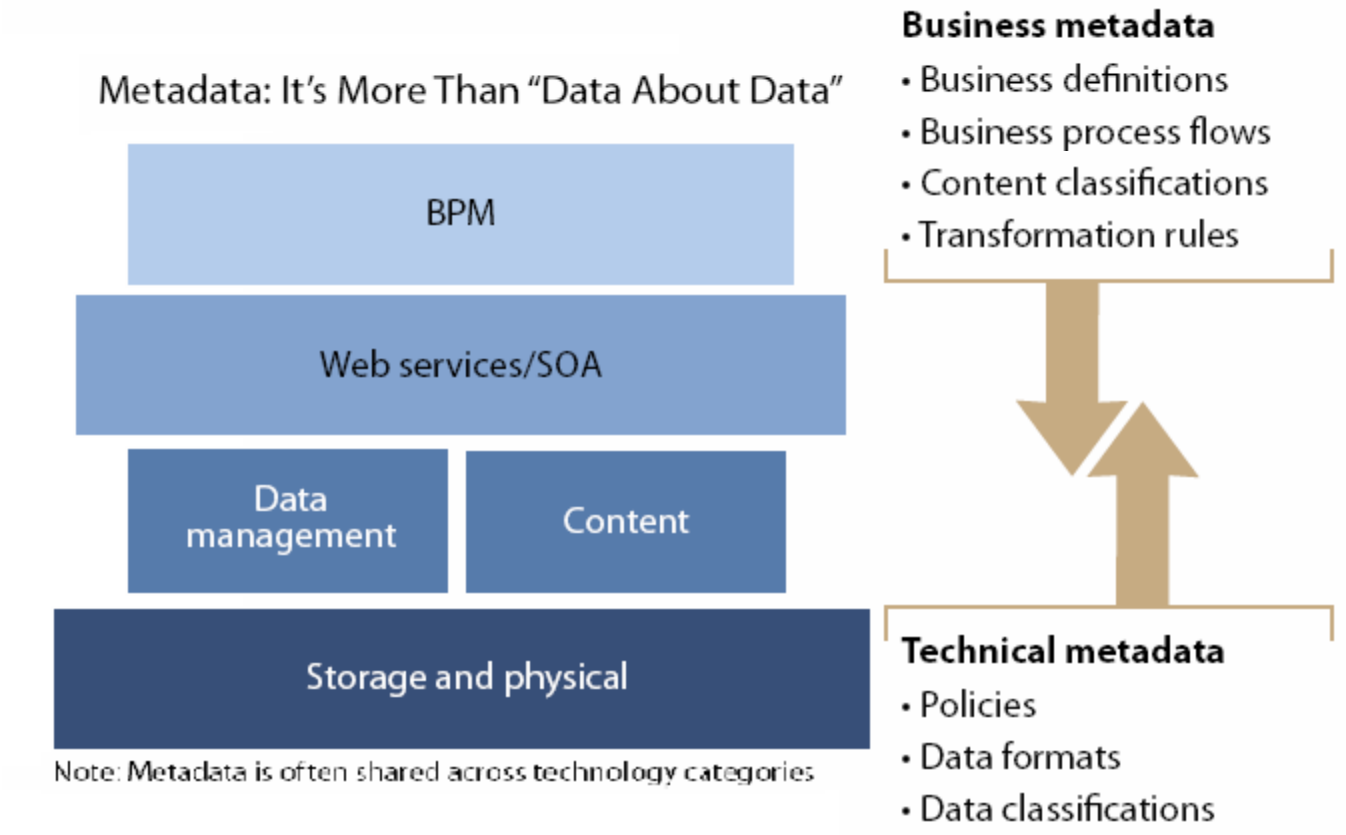
	Data Subject						
Primary Role	**Sales**	**Customer**	**Asset**	**Finance**	**Location**	**Campaign**	**etc.**
Data Owner							
Data Steward							
Business Area							
BI COE							
Marketing							
Purchasing							
Operations							
Sales							
Accounting							
Customer Service							
Europe							
South America							
etc.							

Names go in these boxes

Metadata Management (Forrester)

Metadata Mgmt

- Metadata is the data context that explains the definition, control, usage, and treatment of data content within a system, application or environment. Metadata provides the characteristics to measure data quality in the enterprise



Types of Metadata

Business Metadata – business context and meaning

Business Name	Business Description
Business Rule	Calculations

Technical Metadata – description of database objects

Column Type	Column Length
Column Name	Table Name

Operational Metadata – who, what, where when, why …

Create Date	Update Date
Load Date	Session Data

Harsh Reality about Many Decisions

Data Quality

47% **No confidence in data**

59% **Missing information**

42% **Use the wrong information**

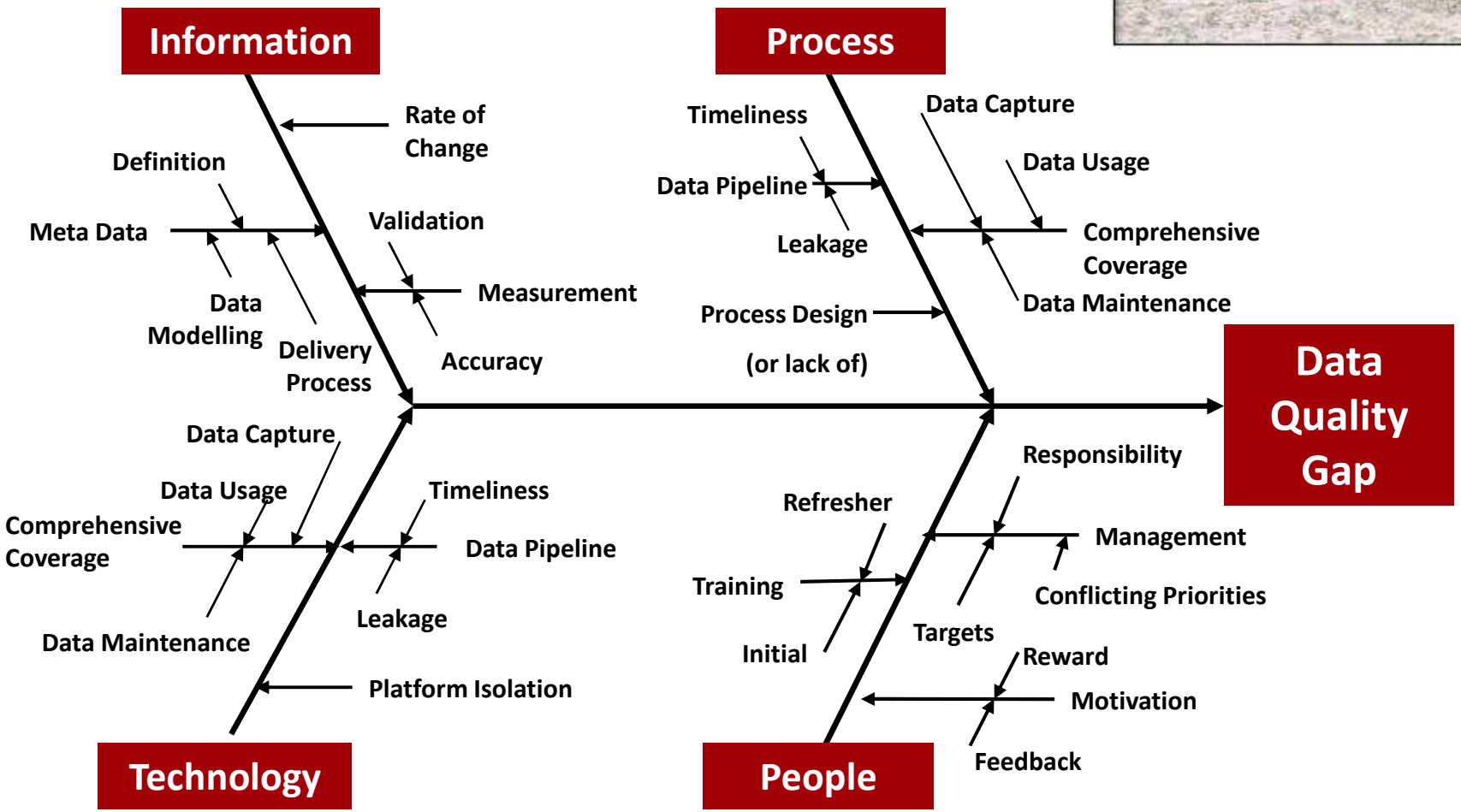
Gartner, Forrester, B-eye-Network

Dimensions of Data Quality

- Accuracy – data correctness
- Consistency – conflicts / redundancy
- Entirety – all of the data
- Breadth – amount of data
- Completeness – data “gaps”
- Uniqueness – (un)necessary data
- Interpretability – correct semantics
- Timeliness – data currency
- Precision - exactness
- Depth – history / retention
- Integrity – validity

$\sum$ =Value

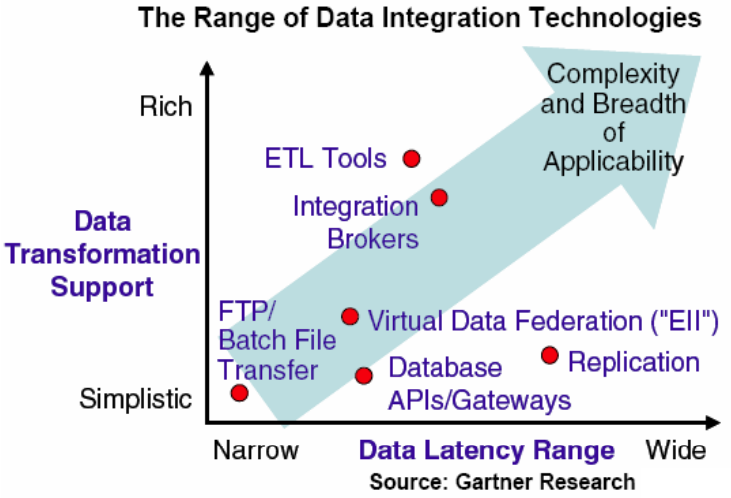
Causes of Poor Quality



Data Integration Topics

Data Integration

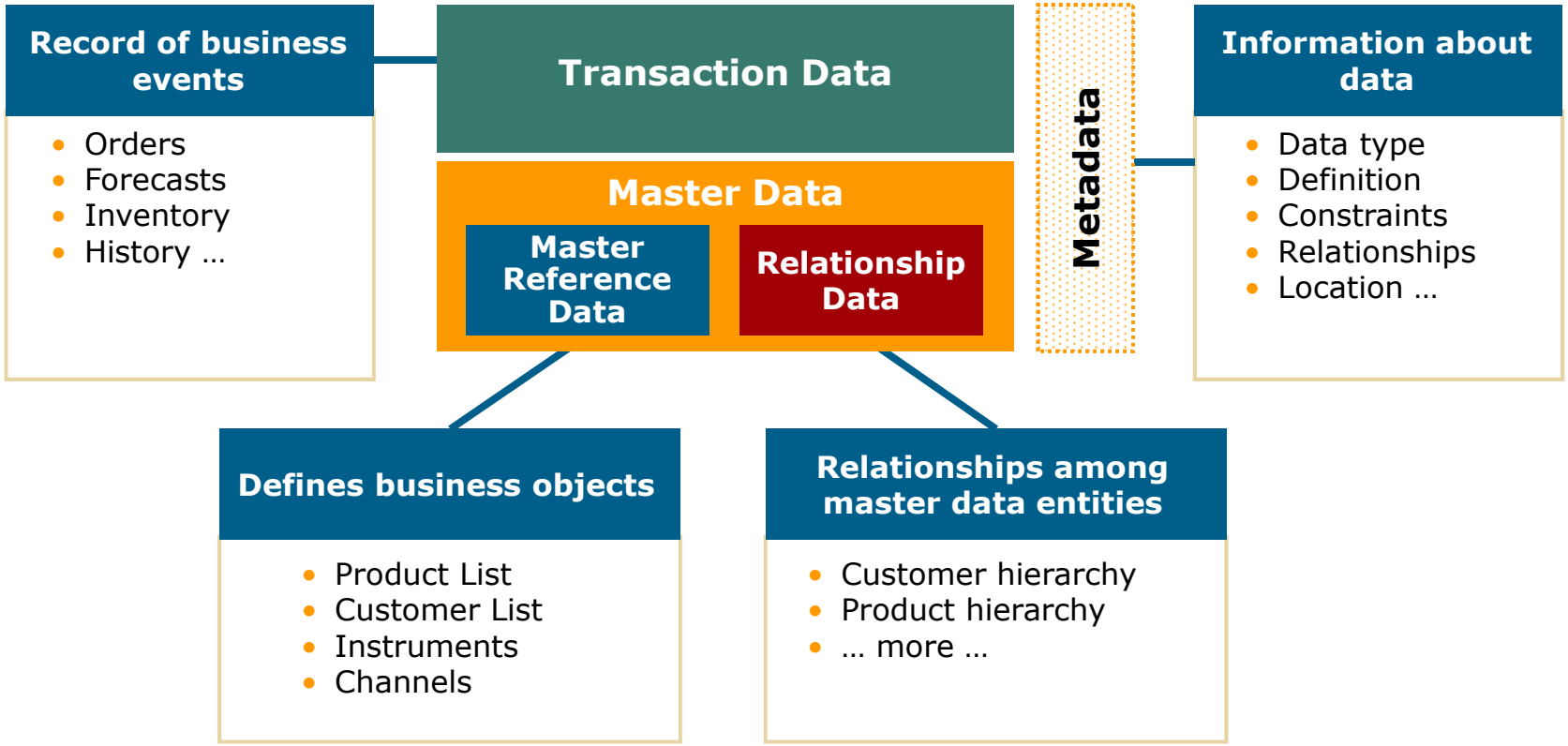
- Identify the data and data sources needed to meet their business requirements
- Define their detailed data integration requirements
- Design and implement data integration architecture and best practices
- Design, build, and test programs needed to source data and make it available in the timeframes necessary to satisfy the business



EAI – Application
EII – End User
ETL – Database
CDC – Database
Custom Code

Master Data Management Process

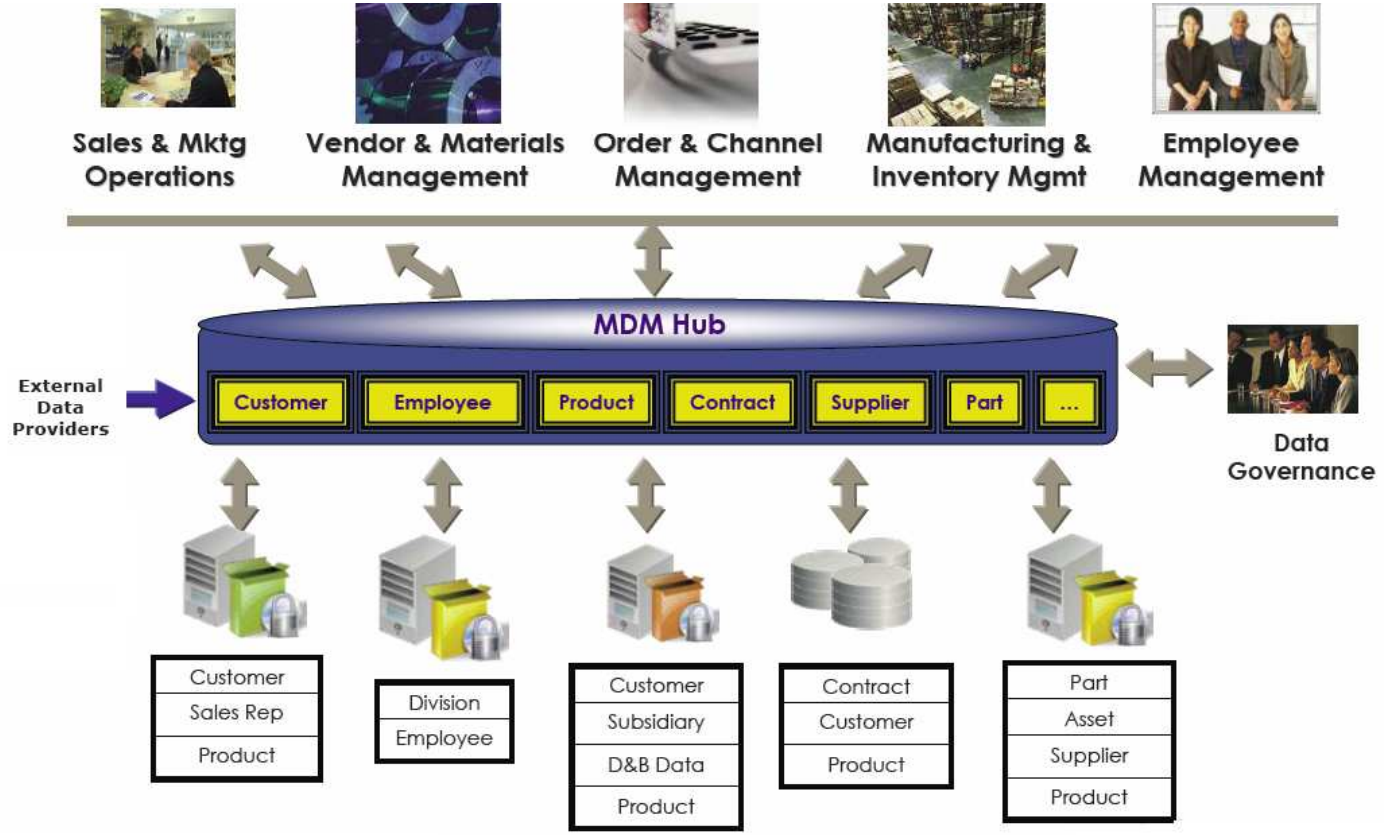
Master Data Mgmt



MDM Process

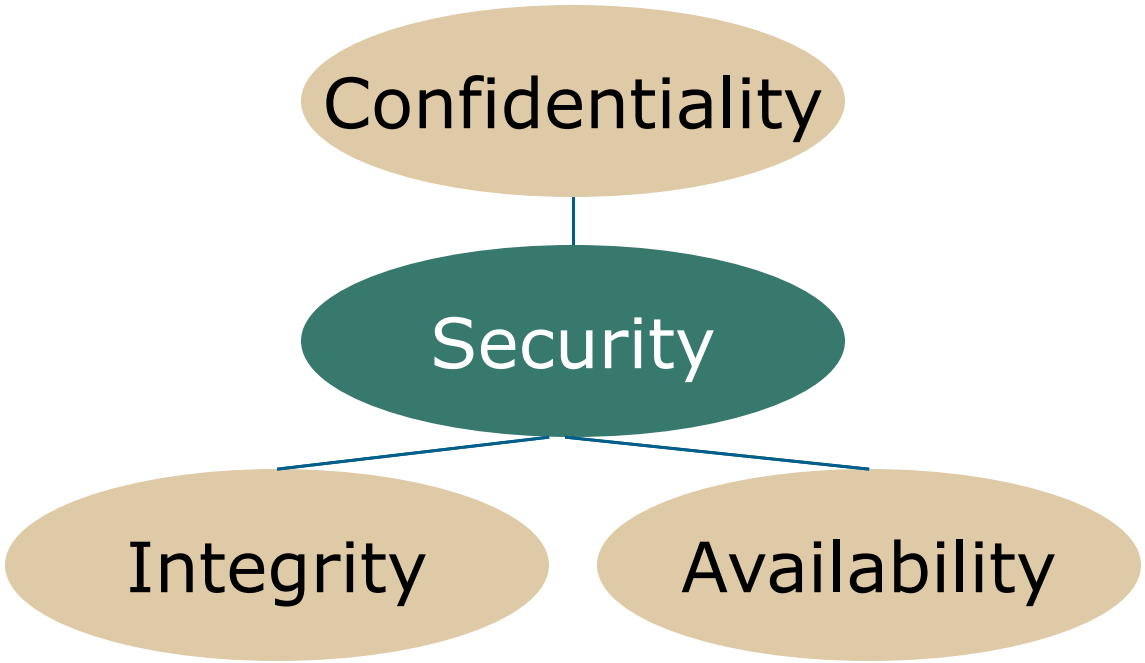
Information Challenges

- Different systems, data, uses, … with duplicate data, no "system of record", and inability to synchronize data across the enterprise
- Authoritative source of information



What is Information Security?

Data Security & Privacy



Security is a Process, Not a Product

- **Confidentiality:** data warehouse assets are accessible only to those with access
- **Integrity:** the accuracy and completeness of data warehouse assets
- **Availability:** ensuring that authorized users have access to data warehouse assets when required

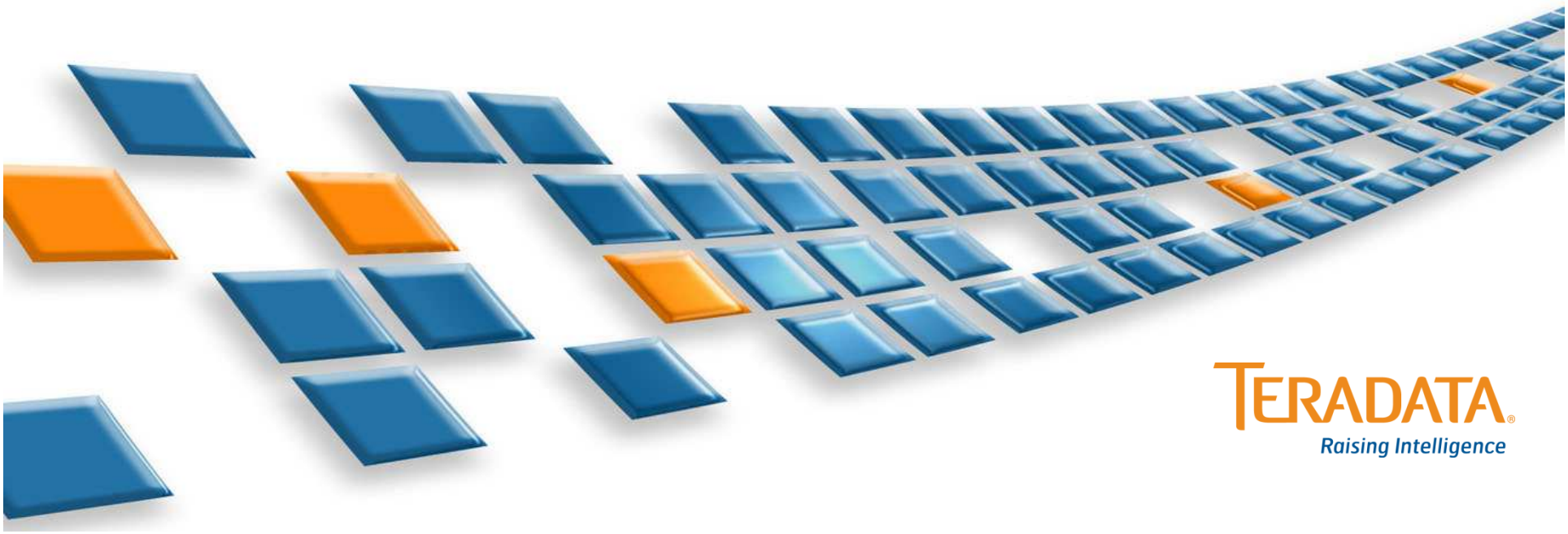
Enterprise Data Management (EDM)

What are the components and how do they work together?

TDWI Denver Chapter Meeting – Oct 2010

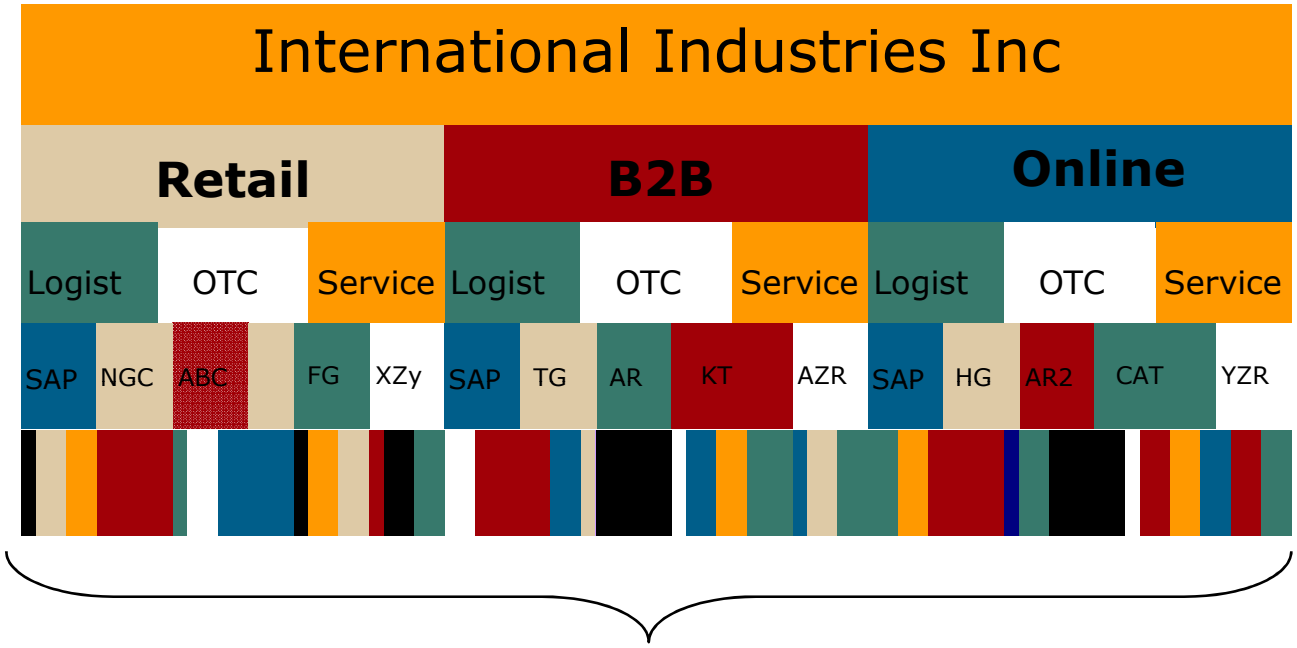
Dave Schiller

Director, Services Marketing



TERADATA
Raising Intelligence

The Challenge



The Enterprise

L.O.B.s

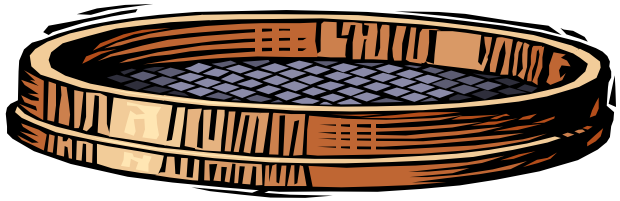
Business Processes

IT Solutions

Data Domains

The pressure exerted by lines of business, business processes and their supporting IT systems results in highly fragmented data domains

Transaction data as it often arrives in the DW



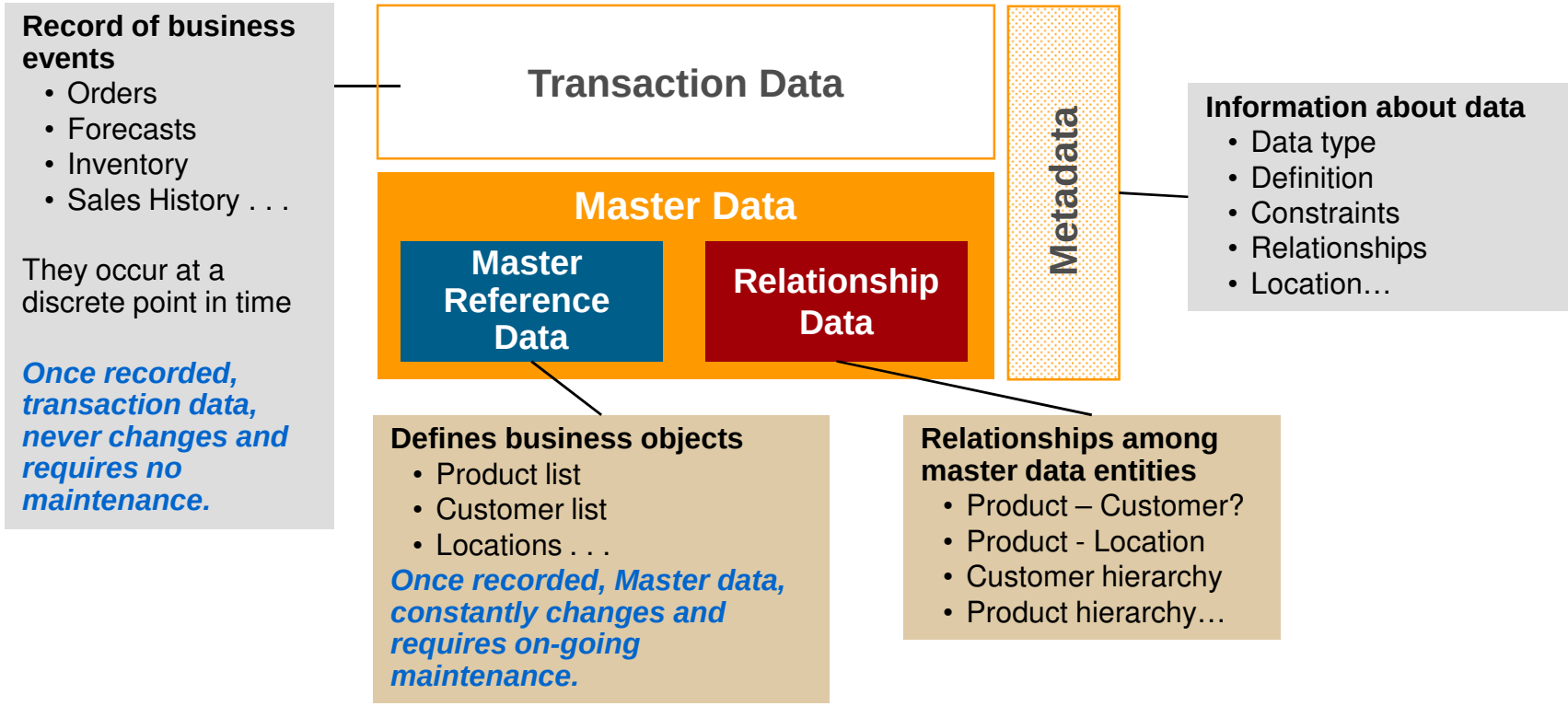
What do these value mean?

	?	?	?	?		?					?
TDF62066654	1	6256179920	1222	M	40.51	486.12	14/09/2006	14/01/2008	40.51	486.12	DD
TDF81204351	1	1710564905	2394	M	200	2400	15/03/2004	15/01/2008	200	2400	DD
TDF81204718	1	840655350	2394	M	406.13	4873.6	16/03/2004	16/01/2008	406.13	4873.6	DD
TDF82201370	1	3097150171	1755	S	359.55		06/04/2004		359.55		CH
TDF82201371	1	3097150171	1814	M	134.83	1618	06/04/2004	06/01/2008	134.83	1618	

Fragmented data with little or no context

This has to be transformed into information

Types of Data



The transaction data is where the money is buried e.g. Orders, Invoices, Credits, Debits, CDR's.

We need to give this data "context"

Assemble definitions

Policy Number	Party Typ cd	Party ID	Product Code	Payment frequency code	Gross Actual Premimum	Gross Annual Premimum	Inception Date	Last Premium Date	Net Actual Premium	Net Annual Premium	Payment Method Code
TDF62066654	1	6256179920	1222	M	40.51	486.12	14/09/2006	14/01/2008	40.51	486.12	DD
TDF81204351	1	1710564905	2394	M	200	2400	15/03/2004	15/01/2008	200	2400	DD
TDF81204718	1	840655350	2394	M	406.13	4873.56	16/03/2004	16/01/2008	406.13	4873.56	DD
TDF82201370	1	3097150171	1755	S	359.55		06/04/2004		359.55		CH
TDF82201371	1	3097150171	1814	M	134.83	1617.96	06/04/2004	06/01/2008	134.83	1617.96	

Adding column titles (meta data) tells us what the columns mean but not the values in them

What do the coded values mean? Product Code and Party ID for example? What do they represent?

Assemble the reference data

Policy Number	Party Type cd	Party ID	Product Code	Payment frequency code	Gross Actual Premimum	Gross Annual Premimum	Inception Date	Last Premium Date	Net Actual Premium
TDF62066654	1	6256179920	1222	M	40.51	486.12	14/09/2006	14/01/2008	40.51
TDF81204351	1	1710564905	2394	M	200	2400	15/03/2004	15/01/2008	200
TDF81204718	1	840655350	2394	M	406.13	4873.56	16/03/2004	16/01/2008	406.13
TDF82201370	1	3097150171	1755	S	359.55		06/04/2004		359.55
TDF82201371	1	3097150171	1814	M	134.83	1617.96	06/04/2004	06/01/2008	134.83

Party ID	Date of Birth	Forenames	Gender Code	Initials	Party Status Cd	Surname	Title
6256179920	05/12/1969	Katie Marie	2	K M	C	Davis	Mrs
1710564905	11/04/1932	Kevin Peter	1	K P	C	Butcher	Mr
840655350	24/06/1933	Joanne Mary	2	J M	C	Batson	Mrs
3097150171	17/01/1939	Sarah Jane	2	S J	C	Johnson	Mrs

Product Code	Product Name
1222	Lifetime Benefit Plan
2394	Long Term Personal Careplan Future Assured
1755	Flexible Protection Bond (FlexiBond) - LIFE
1814	Flexible Protection Bond (Future Assured) - LIFE

The codes point to other (master) data that gives more context to the transaction data. It tells us which product, which customer

Assemble the lookup tables

Policy Number	Party Type cd	Party ID	Product Code	Payment frequency code	Gross Actual Premimum	Gross Annual Premimum	Inception Date	Last Premium Date	Net Actual Premium
TDF62066654	1	6256179920	1222	M	40.51	486.12	14/09/2006	14/01/2008	40.51
TDF81204351	1	1710564905	2394	M	200	2400	15/03/2004	15/01/2008	200
TDF81204718	1	840655350	2394	M	406.13	4873.56	16/03/2004	16/01/2008	406.13
TDF82201370	1	3097150171	1755	S	359.55		06/04/2004		359.55
TDF82201371	1	3097150171	1814	M	134.83	1617.96	06/04/2004	06/01/2008	134.83

Party ID	Date of Birth	Forenames	Gender Code	Initials	Party Status Cd	Surname	Title
6256179920	05/12/1969	Katie Marie	2	K M	C	Davis	Mrs
1710564905	11/04/1932	Kevin Peter	1	K P	C	Butcher	Mr
840655350	24/06/1933	Joanne Mary	2	J M	C	Batson	Mrs
3097150171	17/01/1939	Sarah Jane	2	S J	C	Johnson	Mrs

Product Code	Product Name
1222	Lifetime Benefit Plan
2394	Long Term Personal Careplan Future Assured
1755	Flexible Protection Bond (FlexiBond) - LIFE
1814	Flexible Protection Bond (Future Assured) - LIFE

But customer and product aren't the only codes in the data. What does Party type code 1 mean? What does Payment frequency code 'M' mean, etc

Transaction + Metadata + Reference Master Data + Lookup Master Data

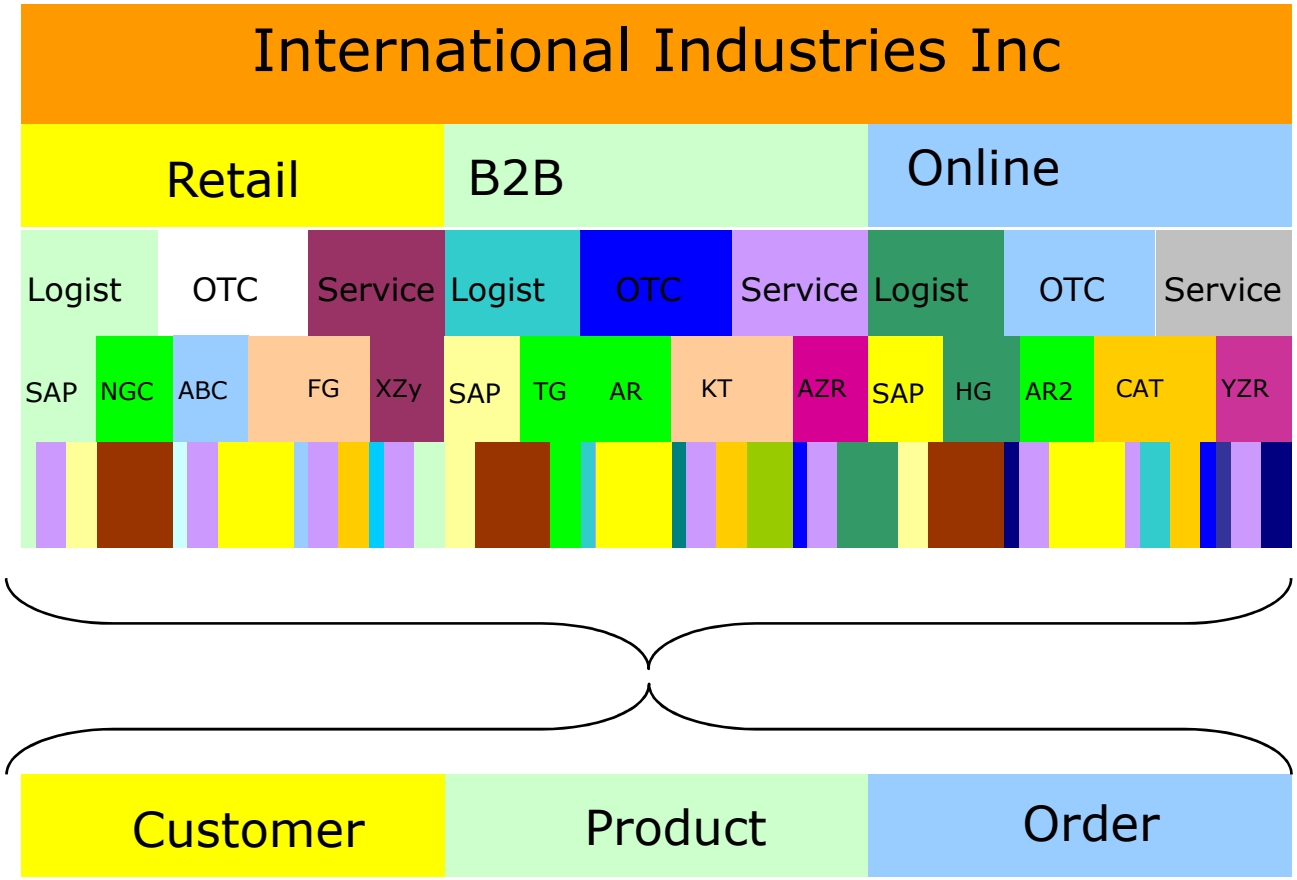
Policy Number	Party Type cd	Party Type Desc	Party ID	Product Code	Payment frequency code	Payment frequency desc	Gross Actual Premimum	Gross Annual Premimum	Inception Date	Last Premium Date	Net Actual Premium	Net Annual Premium
TDF62066654	1	Individual	6256179920	1222	Y	Yearly	486.12	486.12	14/09/2006	14/01/2009	40.51	486.12
TDF81204351	1	Individual	1710564905	2394	Y	Yearly	2400	2400	15/03/2004	15/01/2009	200	2400
TDF81204718	1	Individual	840655350	2394	Y	Yearly	406.13	4873.56	16/03/2004	16/01/2009	406.13	4873.56
TDF82201370	1	Individual	3097150171	1755	S	Six Monthly	359.55	359.55	06/04/2004	16/07/2008	359.55	359.55
TDF82201371	1	Individual	3097150171	1814	Y	Yearly	1617.96	1617.96	06/04/2004	06/01/2009	134.83	1617.96

Party ID	Date of Birth	Forenames	Gender Code	Gender	Initials	Party Status Cd	Party Status	Surname	Title
6256179920	05/12/1969	Katie Marie	2	Female	K M	C	Customer	Davis	Mrs
1710564905	11/04/1932	Kevin Peter	1	Male	K P	C	Customer	Butcher	Mr
840655350	24/06/1933	Joanne Mary	2	Female	J M	C	Customer	Batson	Mrs
3097150171	17/01/1939	Sarah Jane	2	Female	S J	C	Customer	Johnson	Mrs

Product Code	Product Name
1222	Lifetime Benefit Plan
2394	Long Term Personal Careplan Future Assured
1755	Flexible Protection Bond (FlexiBond) - LIFE
1814	Flexible Protection Bond (Future Assured) - LIFE

Only now can we see the full context of the transaction data

The Challenge for EDM



The Enterprise

L.O.B.s

Business Processes

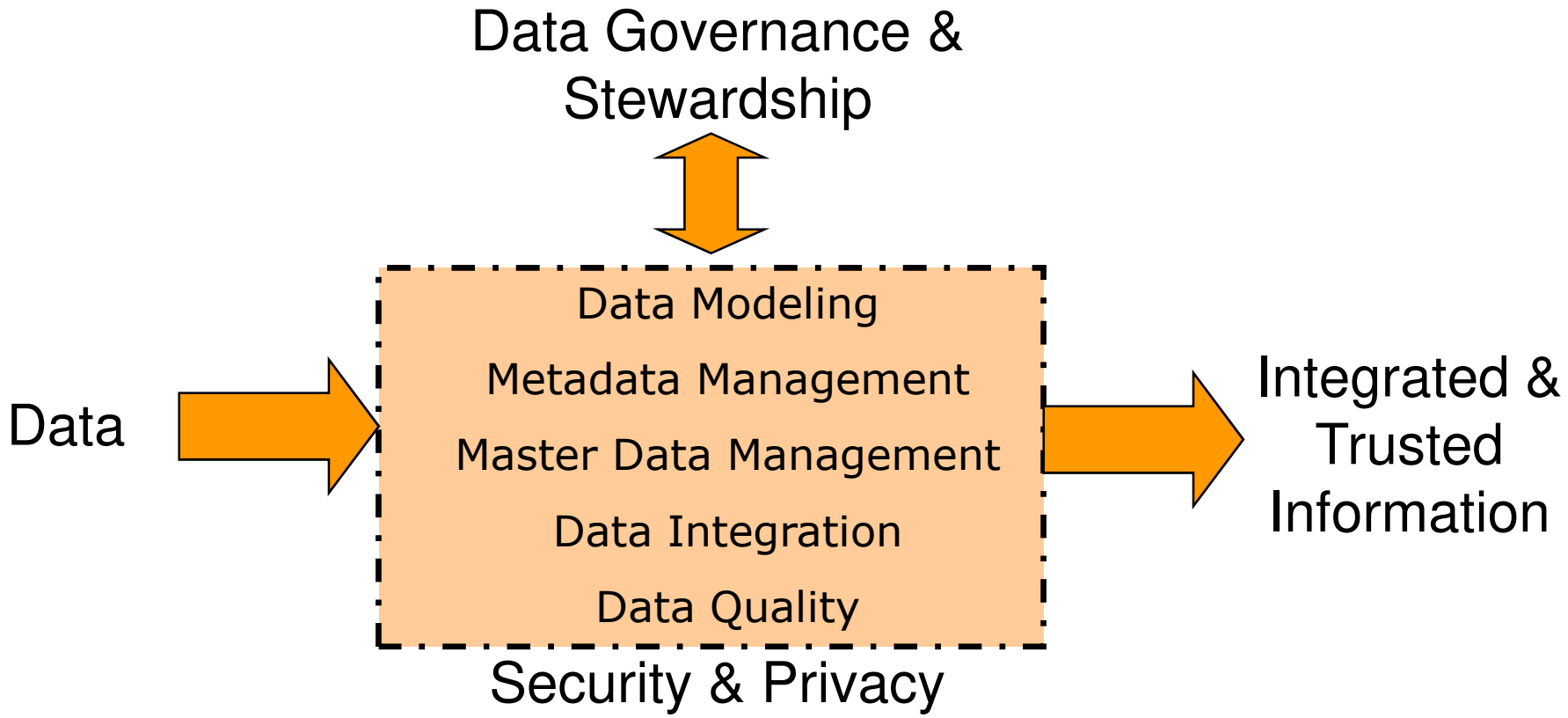
IT Solutions

Data Domains

Re-Assemble into Information

The Challenge for EDM is to reassemble the data, provide context and transform it into information

Purpose of Enterprise Data Management

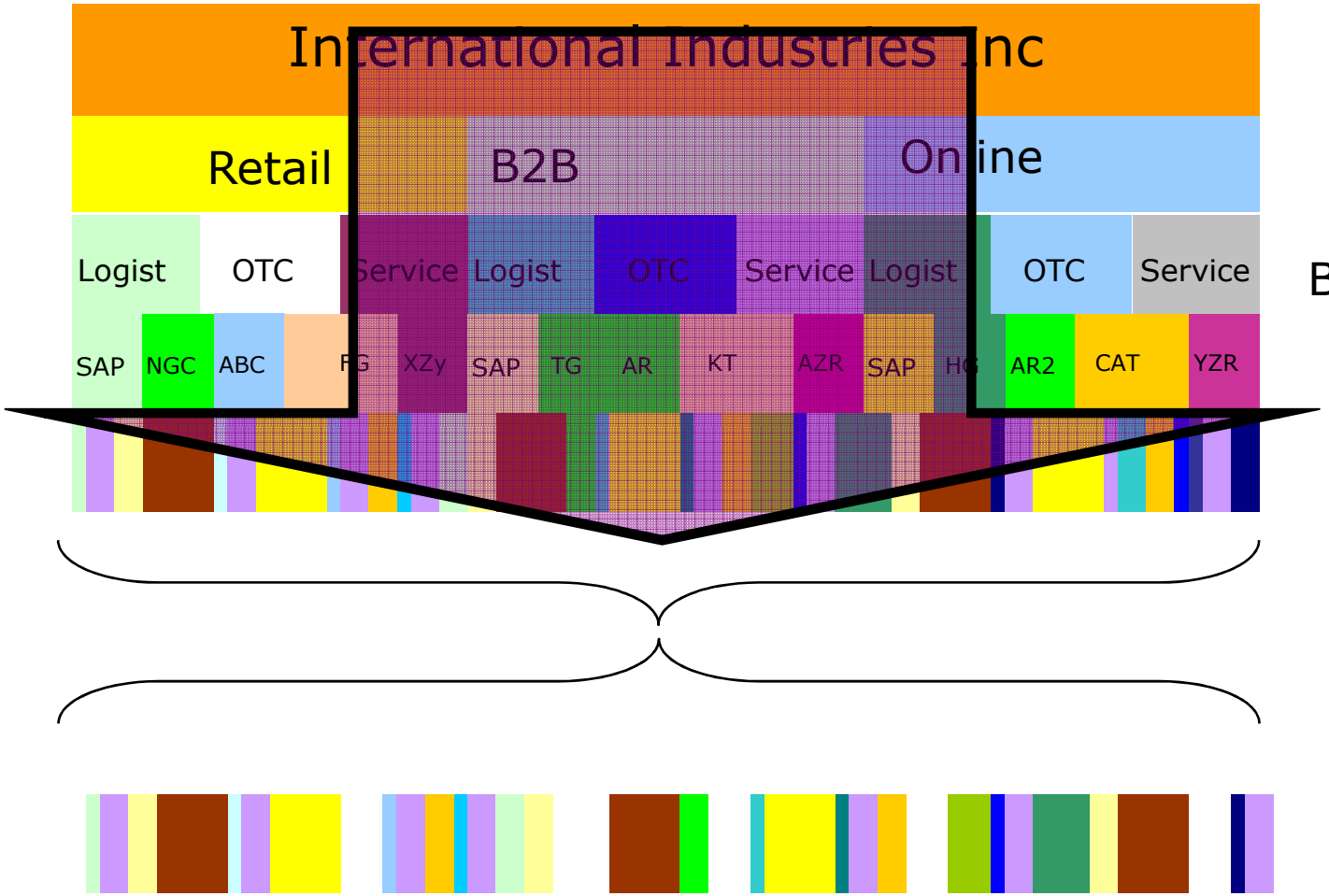


The Purpose of Enterprise Data Management:
To Transform Data into Integrated & Trusted Information

The Role of Data Governance

- Role of Data Governance is to ‘manage’ the Data Management Process making it more effective/efficient
  - > Data Modeling
  - > Data Quality
  - > Master Data Management
  - > Metadata
  - > Data Integration
  - > Security and Privacy

With no Data Governance in place the data can become ‘shredded’, impossible to reassembled into Information



The Enterprise

L.O.B.s

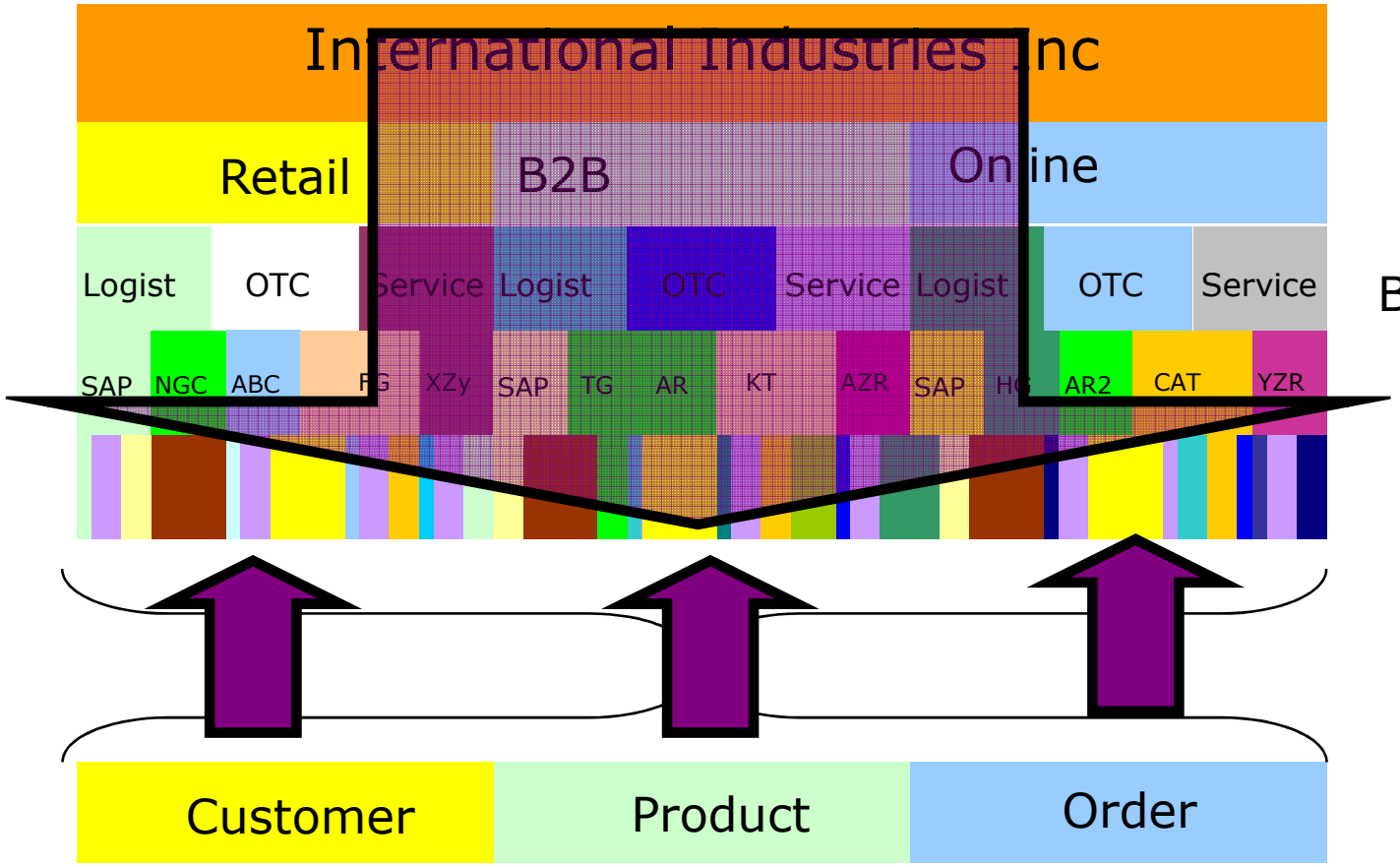
Business Processes

IT Solutions

Data Domains

Fragment Data

Data Governance is needed to balance the pressure so that EDM can do its job



The Enterprise

L.O.B.s

Business Processes

IT Solutions

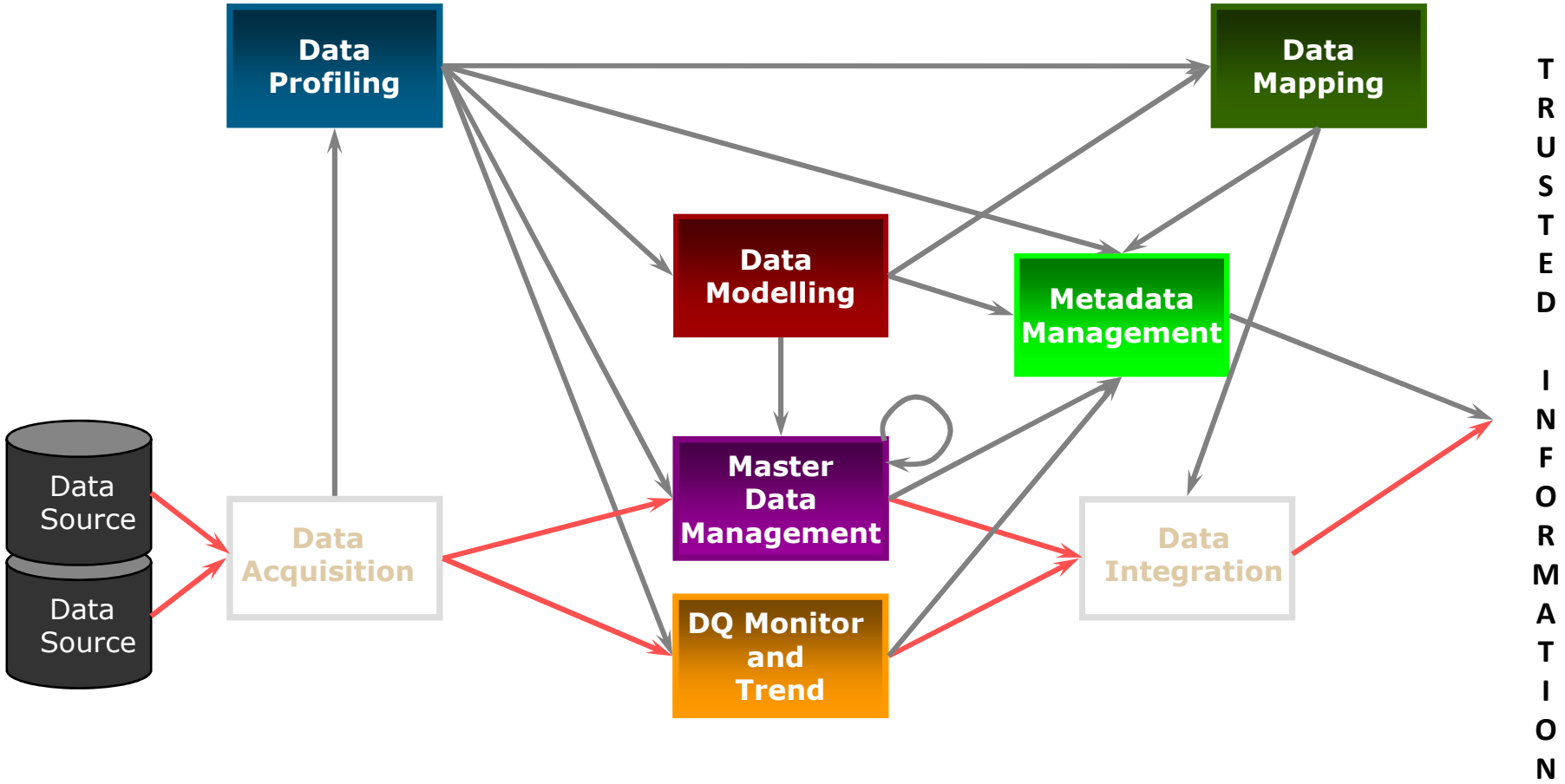
Data Domains

Re-Assemble into Information

Answer BIOs

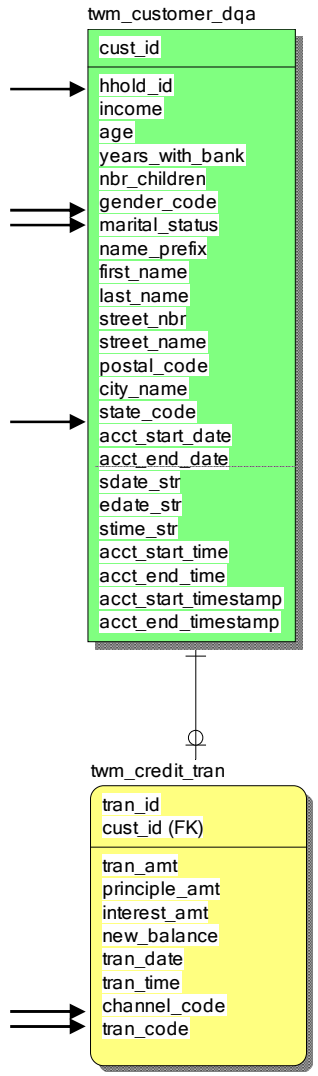
Better cross-selling to customers
Identifying customer needs/problems/ opportunities faster
Adjusting to changed market conditions faster than your competitors

EDM Processes working together



The Scenario – A crtical customer campaign

- The test campaign will target different genders of customer in different states and monitor their activity by transaction channel and by household. They want to differentiate by marital status and need to isolate specific transaction types.
- The following data items are therefore particularly important
  - > Gender of customer
  - > Marital Status
  - > The household the customer resides in
  - > Customer's state of residence
  - > The channel
  - > Transaction code



The Approach

- Confirm the data supports business requirements by performing Data Profiling using Data Profiler
- Define the data model needed to support the requirements in Erwin
- Map data from source to target Implement Business Rules to measure and monitor transaction data quality
- Implement Business Rules and Data Management capabilities to monitor and manage master data and enable Data Stewards to monitor and manage data quality using the corporate preferred toolset
- Publish data definitions and data quality metrics using a metadata services approach

Data Profiling Tasks

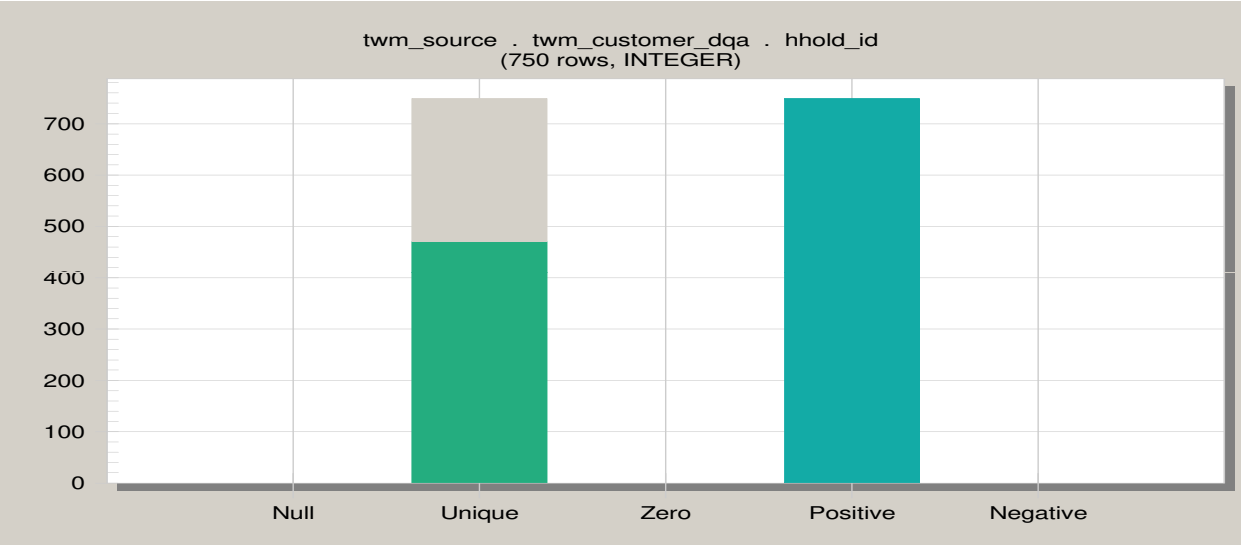
Objective – Understand how well the data supports the business requirements

- Process
  - > Profile the data on Customer and Credit Transaction Table
  - > Collect Data Profiling Results
  - > Review Data Profiling Results with Customer to validate Business Requirements and verify the data to support them
- Outcome
  - > Identified list of anomalies to be addressed in the cleansing process or at the source systems
  - > List of high-use code tables to be incorporated into the data model

There are a variety of data profiling tools available

Collect Profiling results

- A hierarchy of household within the 'Customer' table with some missing household id values

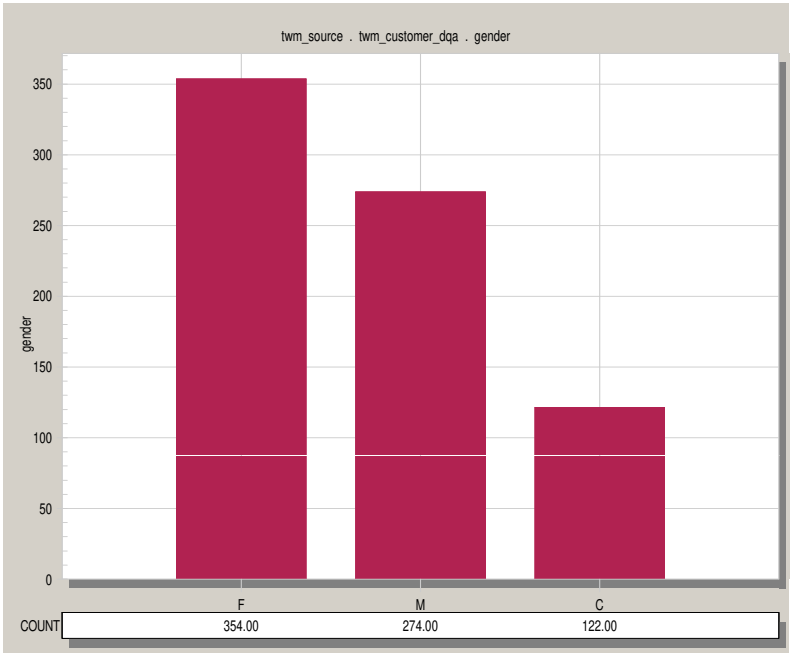


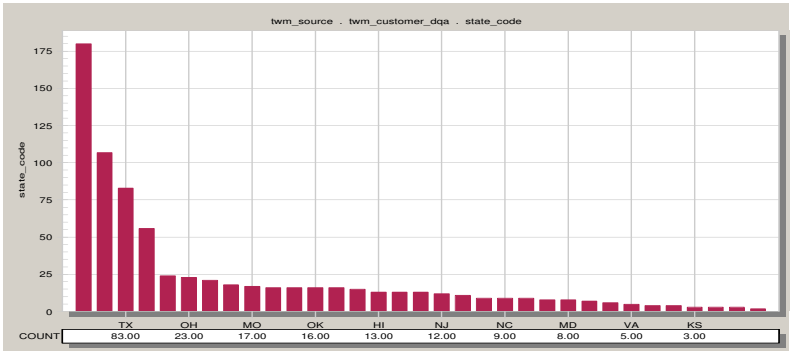
twm_source	twm_customer_dqa	edate_str	VARCHAR(3	750	686	58	0			
twm_source	twm_customer_dqa	first_name	CHAR(30) C	750	0	408	0			
twm_source	twm_customer_dqa	gender	VARCHAR(1	750	0	3	0			
twm_source	twm_customer_dqa	hhold_id	INTEGER	750	5	471		0	750	0
twm_source	twm_customer_dqa	income	INTEGER	750	69	591		85	596	0

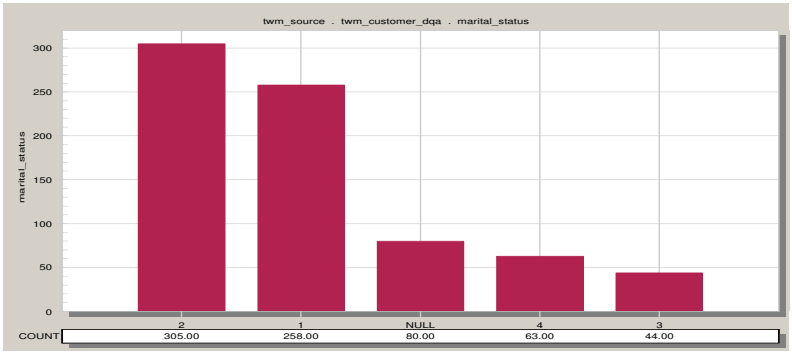
471 Unique Households, 5 without a Household

Collect Profiling results

- Reference codes - gender code, marital status code, state code - in the Customer table have unknown values and no descriptions
  - > 3 unique Gender Codes, All Populated
  - > 4 unique Marital Status Codes, 80 without Status
  - > 33 unique State Codes, All Populated

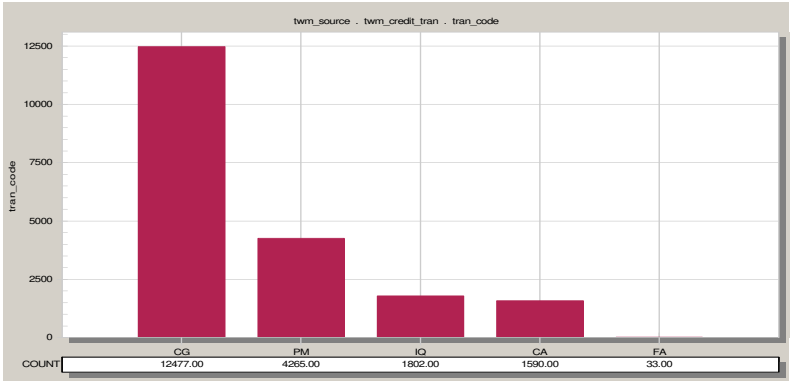


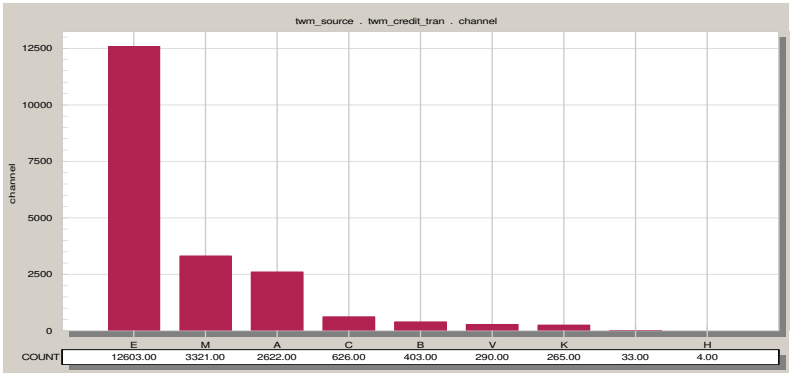




Collect Profiling results

- Reference codes - channel code, transaction code - in the Credit Transaction table with unknown values and without descriptions
  - > 5 unique Transaction Codes, All populated
  - > 8 unique Channel Codes, 33 rows without Channel codes





- High value transaction (over 10,000)

xdb	xtbl	xcol	xcnt	xmin	xmax	xmean	xstd
twm_source	twm_credit_tran	cust_id	20167	1362480	1363492	1362986.68	293.4563
twm_source	twm_credit_tran	interest_amt	20167	0	164.52	2.20342639	8.130102
twm_source	twm_credit_tran	new_balance	20167	-17300	0	-1130.34944	1377.655
twm_source	twm_credit_tran	principal_amt	20167	-1565.5	17300	-1.43015669	451.5247
twm_source	twm_credit_tran	tran_amt	20167	-1565.5	17464.52	0.7732697	455.9037
twm_source	twm_credit_tran	tran_date	20167	19950101	19951231	19950714	107.8629
twm_source	twm_credit_tran	tran_id	20167	1	155	28.5430654	21.94547

Review Profiling results to validate Business requirements

- Household
  - > Users confirm the household hierarchy exists and that all customers should belong to a household. A household is people with the same surname, house number and postcode.
  - > Users would like to see this rule monitored and be informed when it is broken.
  - > Users also would like to be able to amend the household hierarchy
- Reference codes
  - > Users confirm that only a certain list of code values is valid for each of the reference codes
  - > Users want be told when new code values appear in the incoming records that are not in the list, so that they can either correct the customer record or add a new code value to the list if necessary
  - > Users also would like to see code descriptions to accompany the code
- High value transactions
  - > Users request that any amount in excess of 10,000 should be reported

Data Modeling Tasks

Objective – Update Data Model to reflect data structures revealed through profiling

- Outcome
  - > Updated Data Model
- Process
  - > Open most current Data Model in the data modeling tool
  - > Use findings from data profiling activities plus business requirements to identify changes needed the Data Model
  - > Enhance the Data Model (with Household and Lookup tables)

Data Mapping

Objective – Map data from original sources tables to new target data model

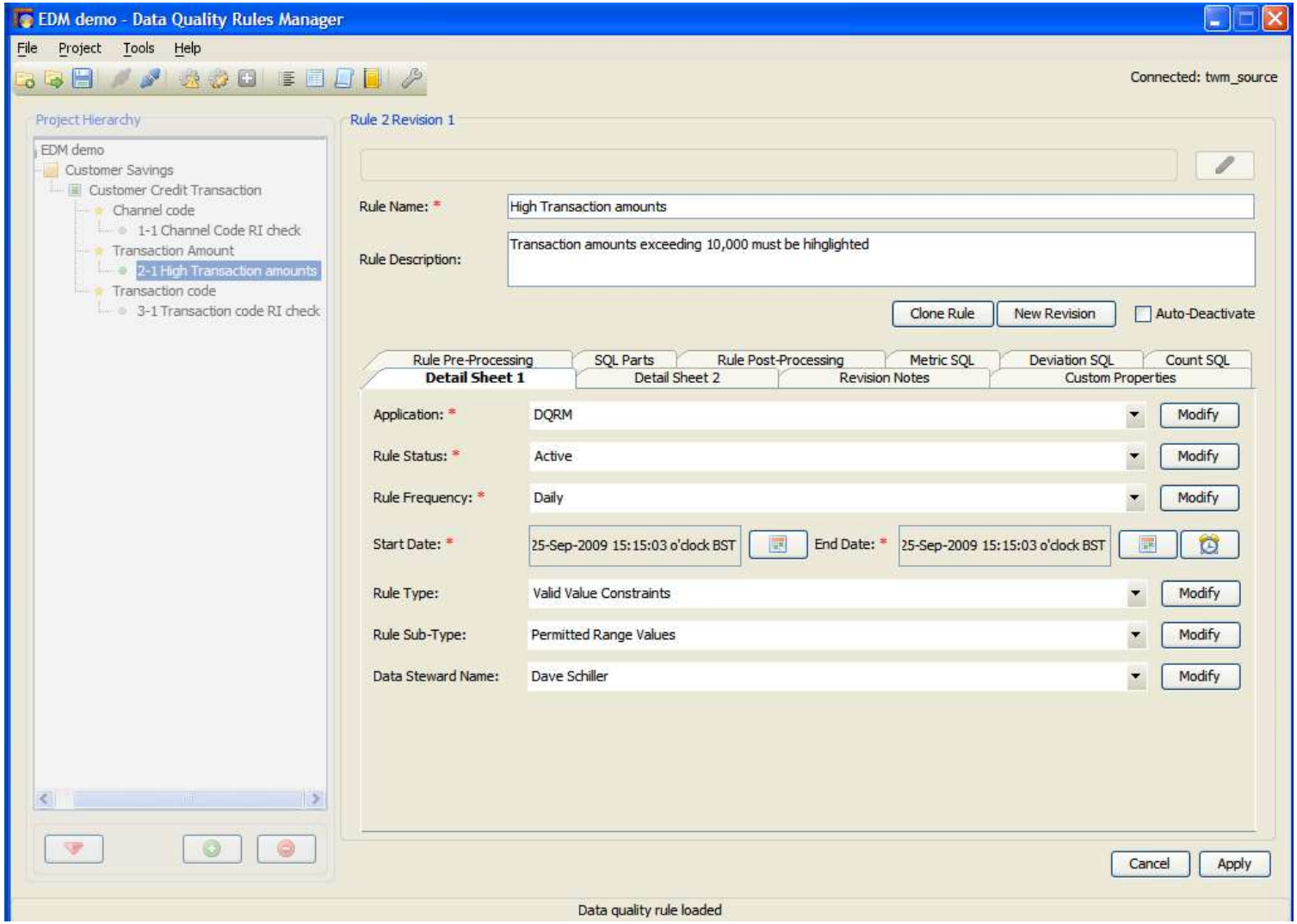
- Outcome
  - > Mapping document and optional SQL to move data from source to target
- Process
  - > Import data models from tool(s) (e.g. ERwin or Excel)
  - > Use automated mapping discovery features to map source to target
  - > If needed, drag & drop mapping feature to create remaining mappings
  - > Export mappings to Excel, and/or generate SQL

Data Quality Monitoring and Trending Tasks

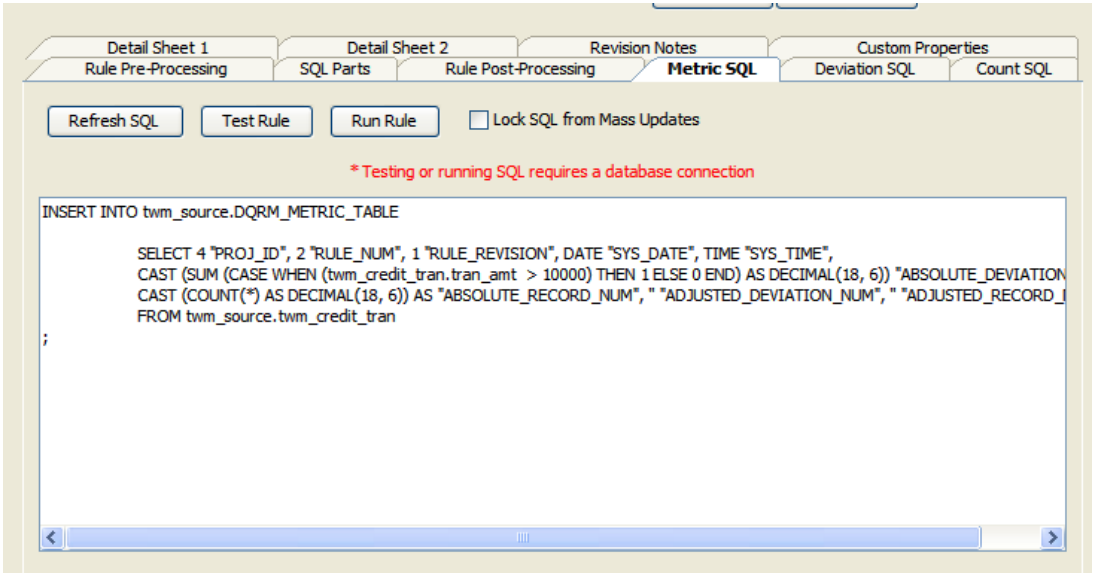
Objective – Create rules to monitor the quality of transaction data

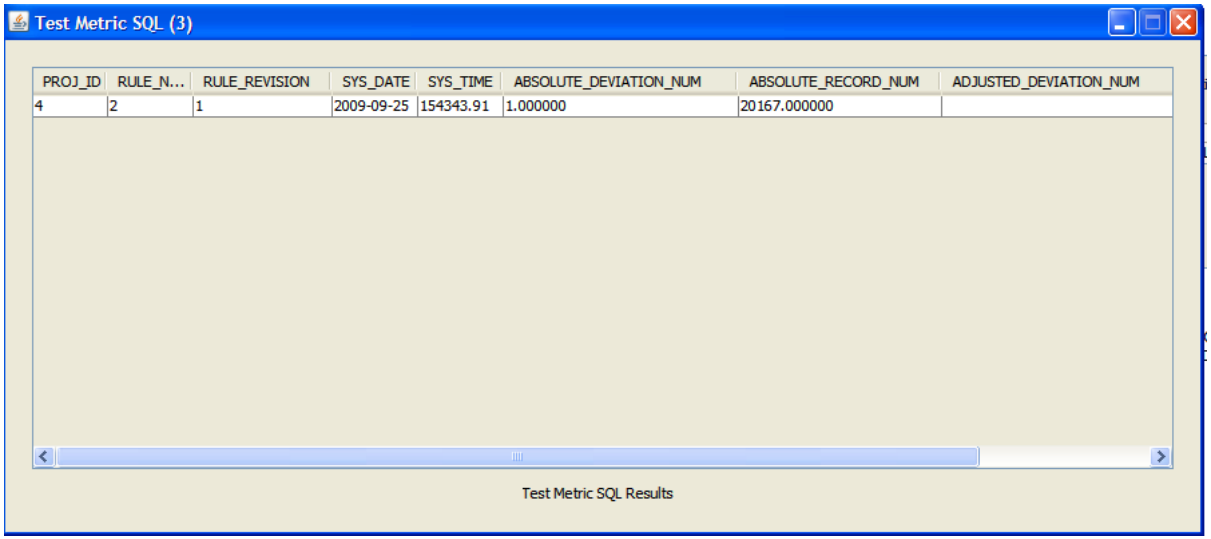
- Outcome
  - > Rules for monitor transaction data created, tested and validated against findings from data profiling
- Process
  - > Use data profiling results to define data quality rules
  - > Design data quality rule to monitor 'High Transaction' amounts
  - > Code data quality rule to monitor 'High Transaction' amounts
  - > Test data quality rule to monitor 'High Transaction' amounts and verify its results match data profiling results

Design Data Quality rule to monitor 'High Transaction' Amounts



Test Data Quality rule to monitor 'High Transaction' Amounts





Master Data Management Tasks

Objective – Create processes to monitor and manage Customer, Household and related lookup data

- Outcome
  - Services defined to load and validate code tables and set default customer household ids

Process

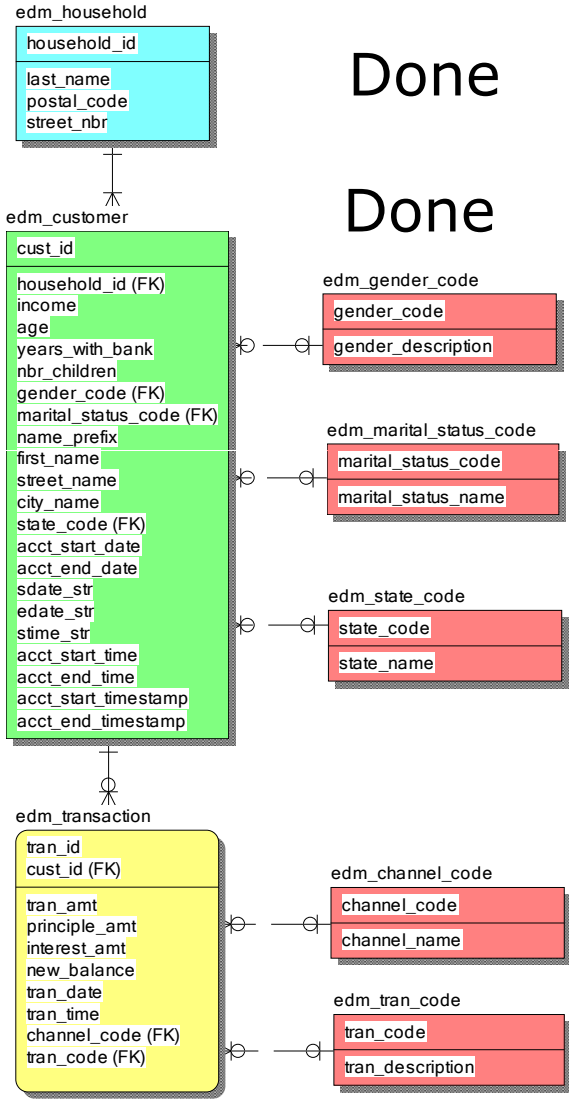
- Import enhanced data model into MDM toolset
- Import data model definitions
- Create and configure required services and schemas
- Upload Excel Lookup files exported from data profiler tool
- Use Upload Document to import Excel Lookup Code files
- Define Business Rules to validate incoming lookup codes
- Define Business Rule to populate missing household id’s
- Define relationship and hierarchy between customer and household

Data Stewardship Tasks

Objective – The create processes that will enable Data Stewards to monitor and correct the master data when required

- Outcome
  - > Rules for monitor transaction data created, tested and validated against findings from data profiling
- Process
  - > Load the raw source data into MDM inbound staging area
  - > Add Code Descriptions to uploaded Lookup value codes
  - > Move loaded customer data into MDM master area to trigger business validation rules, correct invalid records and/or add new code values to the Lookup tables
  - > Load Customer and Household table in MDM Master Area
  - > Open Hierarchy Viewer and move household members with household id = 0 to their respective household

Master tables populated and clean



Done

Done

Done

Done

Done

Done

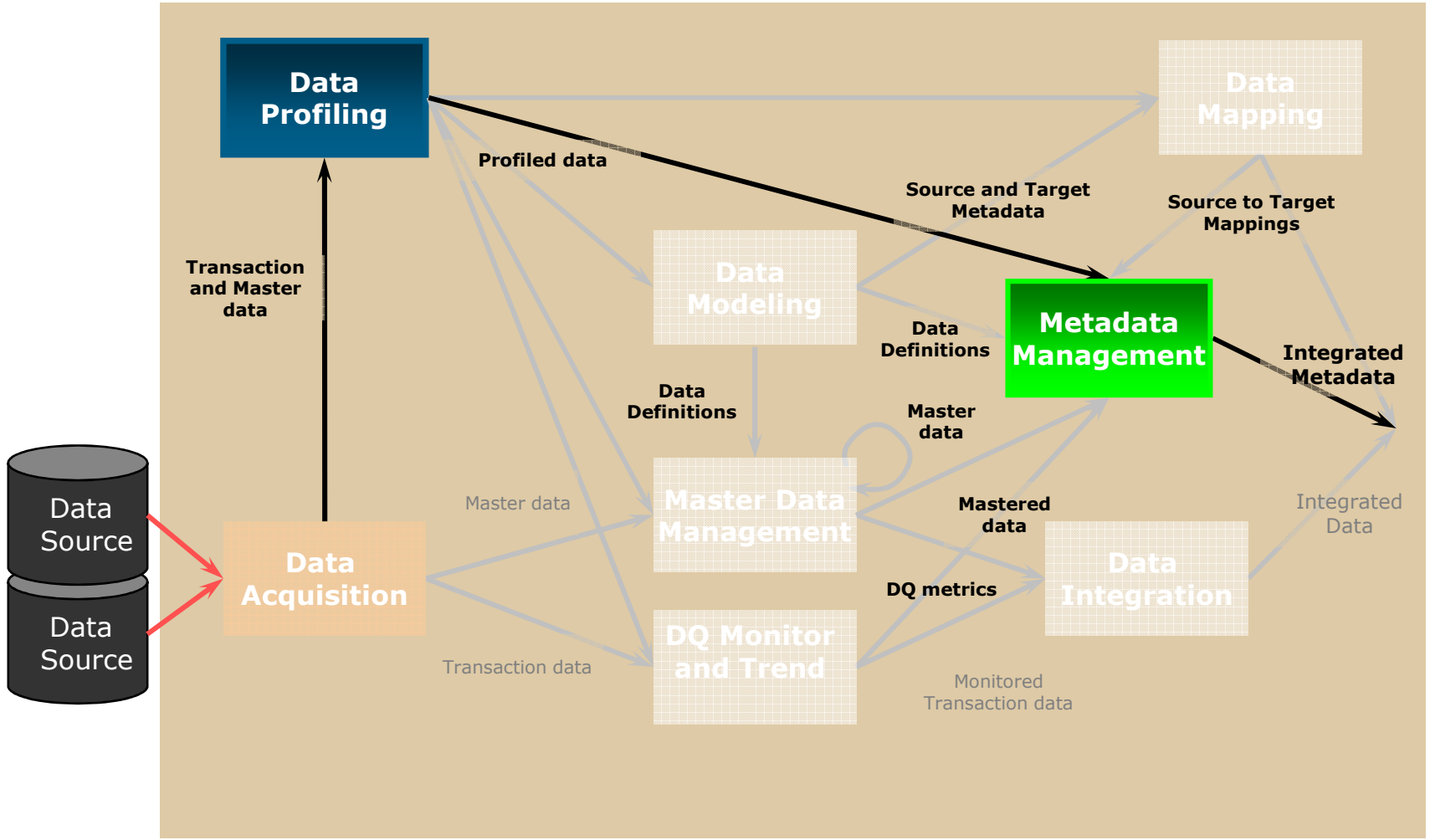
Done

Publishing Metadata to Users

Objective

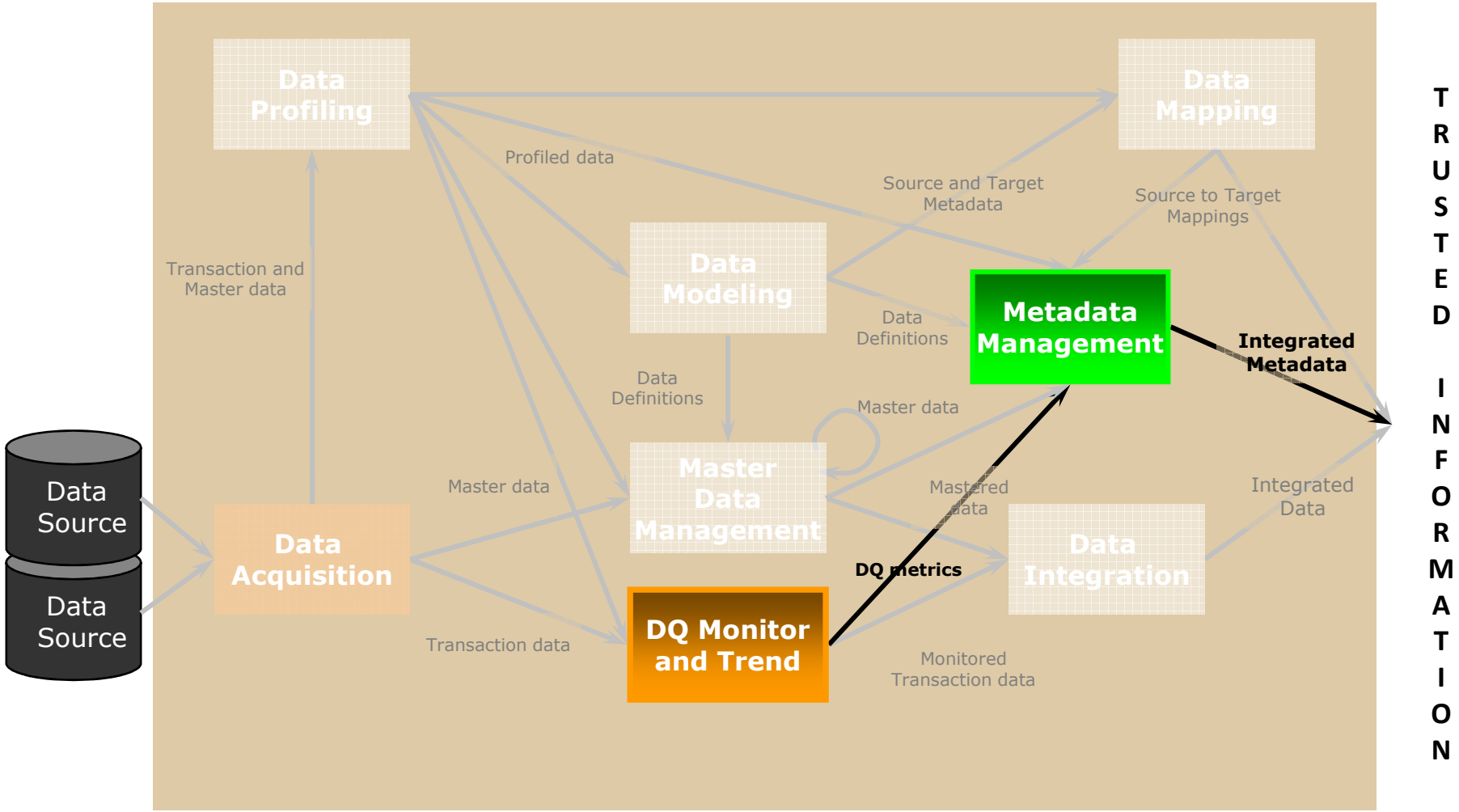
- Provide users with one stop shop so they can find out where data is held within the EDW and learn what to expect in each of the fields they might want to query e.g.
  - > What age ranges to expect?
  - > What gender codes to expect?
  - > What channel codes to expect?
  - > What data quality rules are applied to them?
  - > What are the sources for gender codes?
  - > How customers relate to a household (hierarchy)

Use metadata management to integrate and publish findings of data profiling

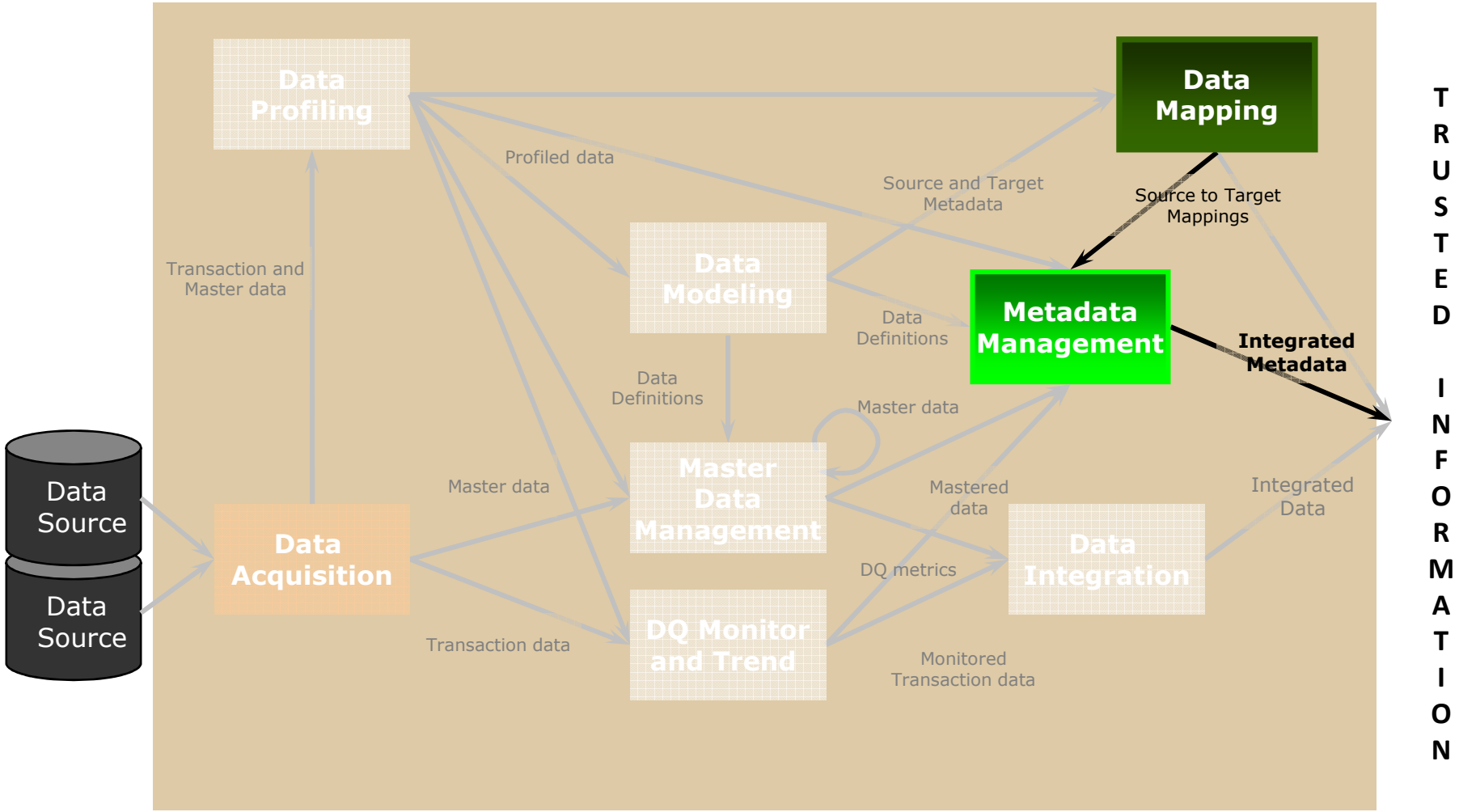


TRUSTED INFORMATION

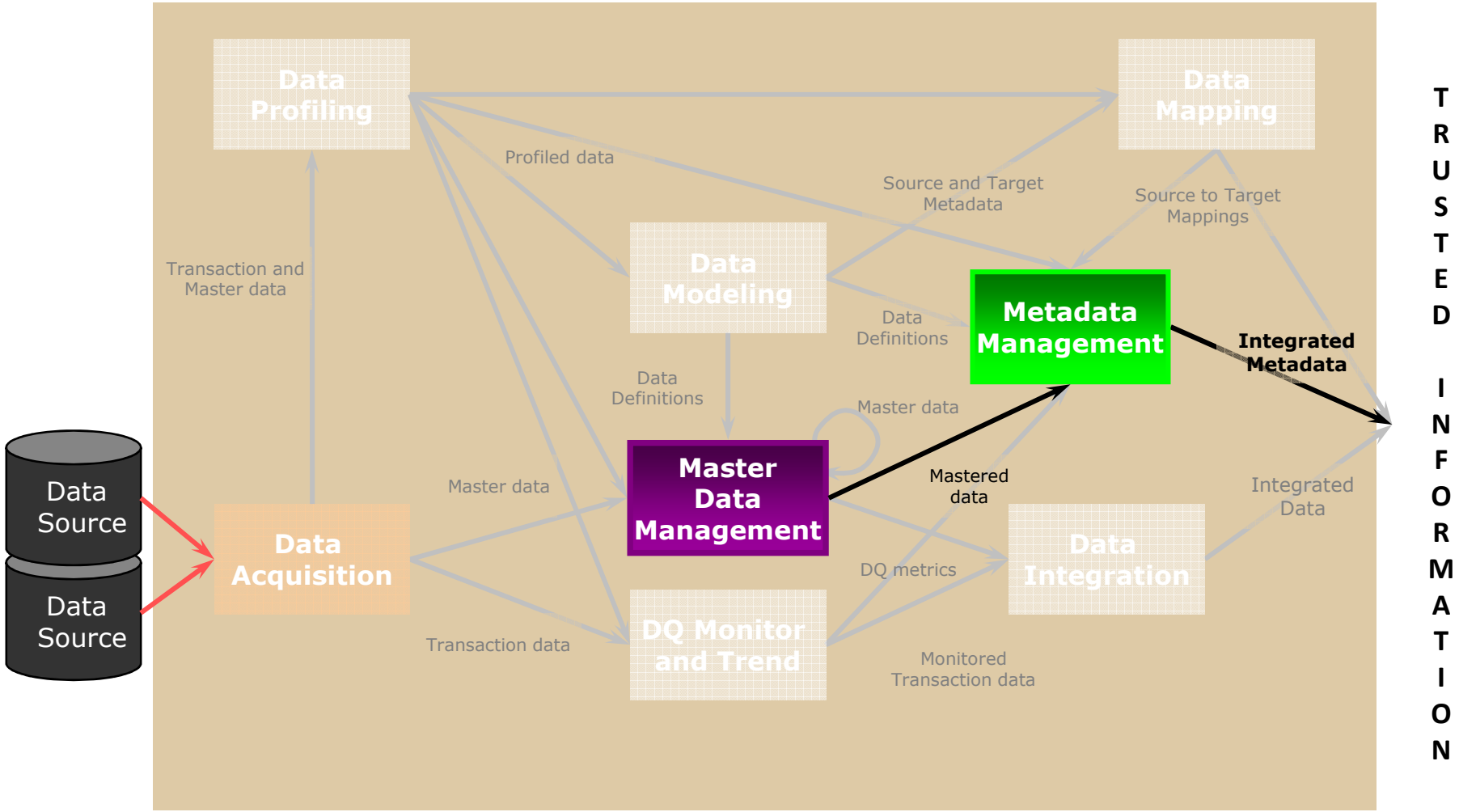
Use metadata management to integrate and publish data quality rules



Use metadata management to integrate and publish data mappings



Use metadata management to integrate and publish master data information



Attribute Metadata Summary

- Gender
  - > Customer's sex/gender is held in the Gender_Code field
  - > Gender_Code belongs to the EDM_Customer table
  - > Gender_code was populated correctly with 3 values- C/Unknown, F/Female and M/Male per its permitted value list
  - > Business rule validates the populated values against the Gender_Code lookup table
  - > Gender_Code in the EDM_Customer table originated from Gender_Cd in the TWM_Customer_DQA table

Household / Customer Summary

- Household_Id identifies a Household in the EDM_Household table
- Household_Id in the EDM_Customer table relates a Customer (Cust_Id) to a Household
- Hierarchy is built using the "customer belongs to a household" relationship
- Household Hierarchy (related by Household_Id)
  - > Household_Id (Parent)
    - – Cust_Id (Child)

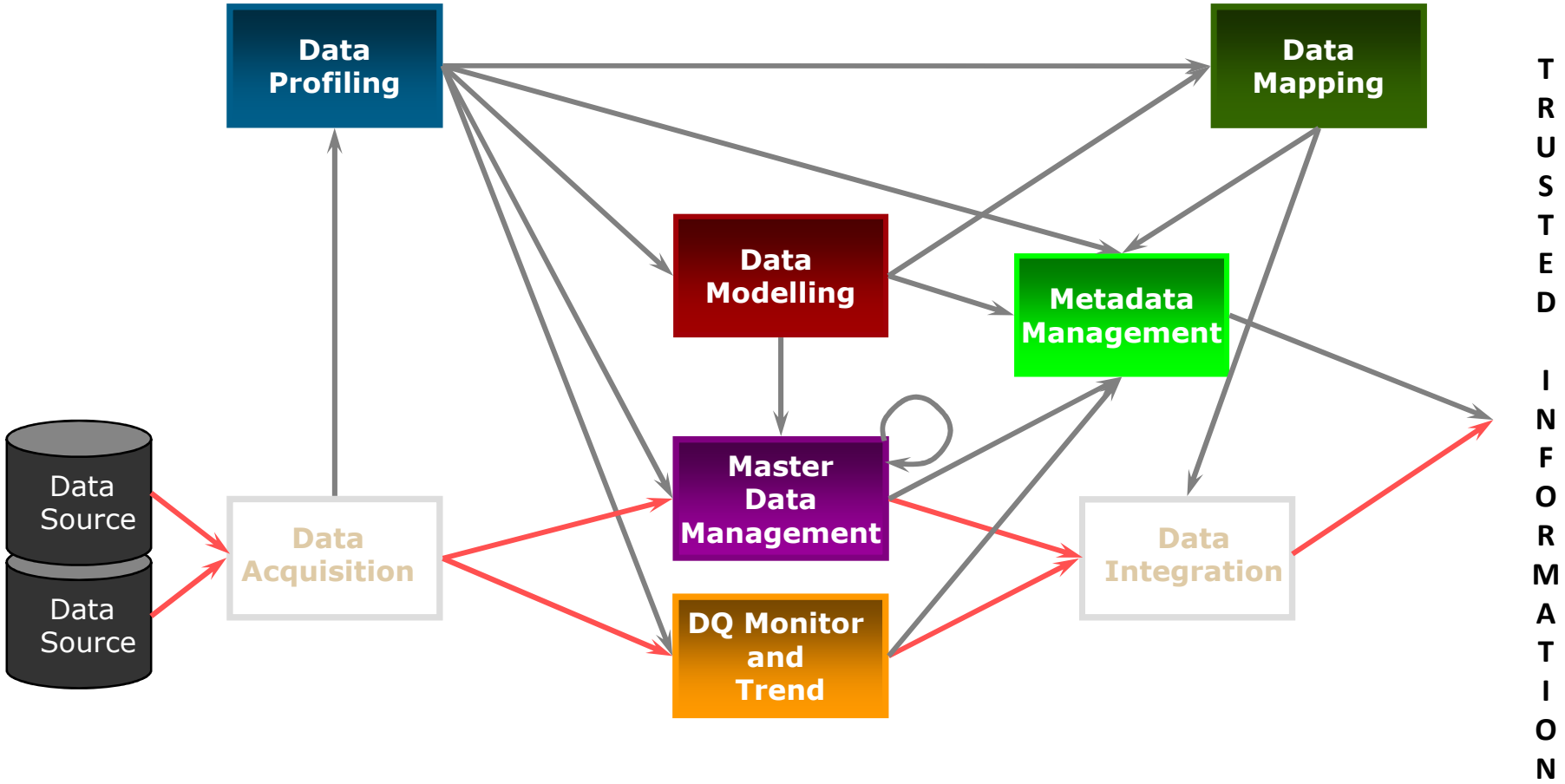
Age Summary

- Customer's age is held in the age field
- Age belongs to the EDM_Customer table
- It is a continuous variable with values from -1 to 150 (potentially incorrect)
- Requires data quality improvement initiative

Channel Code Summary

- Channel Code is held in the Channel_Code field
- Channel_Code belongs to the EDM_Transaction table
- Business rule validates the populated values against the Channel_Code lookup table

EDM Processes working together



Thank you!

Questions and Answers

Lance.Miller@Teradata.com
+1.719.268.6630

David.Schiller@Teradata.com
+1.720.652.0904