Oracle Data Integration & Governance Workshop

ROI Of Data Governance

Milomir Vojvodic Director Business Development - Data Integration EMEA



Highest Friction Point To DG&DI Adoption

Getting Budget Approval



Developer Resistence



Source : Info-Tech Group "Friction Points To DI Adoption"



Data Integration Competency Center

And

Total Economical Impact



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Integration Competency Center

Data Integration

Reflects the convergence of Enterprise Application Integration (EAI), Data Integration (DI) and Extract, Transform, load (ETL) vendors.
Encompasses data consolidation, federation, propagation and access.
Is gaining momentum as enterprises move from hand-coding to tools.
Prevents silos of information and enables an enterprise-wide view of data.

Process Integration

•Is workflow automation for processes, e.g. online ordering.

Emphasizes a top-down process design approach to a greater extent than the other two, starting from a process model.
Allows organizations to streamline process and creates opportunity for coordinated escalation

SOA & Middleware

Is used to connect enterprise apps without transforming the data.
Creates access to data in distributed architectures.
Requires advanced architecture to achieve success.

Distribution Of Savings In 5 Years

from 100% of ICC benefits in 5 years



Distribution Of Savings In 5 Years

from 100% of Data Integration CC benefits in 3 years



Source : Analysis Of Oracle Customer References



ICC Life Cycle



Analytical & Operational Data Integration



Reusability Of DIS Licenses

Product Needs To Be Available – No Issues



Need Planned Outage

- Upgrade
- Migration
- Maintenance





Need Additional Computing Resources

- Performance issues
- Growth

Protect From Unplanned Outage

- System Failure
- Data Failure



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Data Integration Trends



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Exponential Chaos

of integration scenarios

Point-to-point integration architectures cannot keep up with business growth

and represent weak links in mission critical integration scenarios.



P2P Integration DI Tooling

Architecture





Exploding Data Volumes





Big Data



Load from big data processing into your data warehouse for further analysis
 Access your customer information while you process through your big data in order to look for patterns

Oracle Data Integration & Governance



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Data Governance – more than just technology



Separation Between Originators and Consumers





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Data Gov Economic Impact – Reduce Negatives

1-Reduce project risk by 40%

2-Avoid data remediation costs (manual effort, custom code) by 80% (Cut costs of handling duplicate data by 95%)

3-Avoid error costs (incorrect orders, inventory etc.) by 20%

4-Decrease costs of unnecessary system changes due to data quality problem by 90%

5- Avoid costs of un-doing work by 95%

6- Reduce analytical project costs by 30% (not anymore ..post remediation costs, unnecessary mistakes)

7 - Reduce data maintenance costs by80% (not anymore.. hard to change, long to find)



Data Gov Economic Impact – Improve Positives

8-Speed up other systems, integration & processes by 10% (outputs and inputs in communication are correct and accurate data)

9-Increase BI, DW, CRM, Apps ROI by 15%

10-Gain by 10% more revenue due to agility to quickly reacting on ongoing market opportunities

11- Increase internal productivity and efficiency due to correct data by 15%

12- Increase revenue by 10% from gaining new customers and customer satisfaction Increase scalability

13- Improve the value of the company to those who would acquire it by 10%



DG Economic Impact

1-Reduce project risk by 40%

2-Avoid data remediation costs (manual effort, custom code) by 80% (Cut costs of handling duplicate data by 95%)

3-Avoid error costs (incorrect orders, inventory etc.) by 20%

4-Decrease costs of unnecessary system changes due to data quality problem by 90%

5- Avoid costs of un-doing work by 95%

6- Reduce analytical project costs by 30% (not anymore ..post remediation costs, unnecessary mistakes)

7 - Reduce data maintenance costs by 80% (not anymore.. hard to change, long to find)





■After DG ■Before DG

8-Speed up other systems, integration & processes by 10% (outputs and inputs in communication are correct and accurate data)

9-Increase BI, DW, CRM, Apps ROI by 15%

10-Gain by 10% more revenue due to agility to quickly reacting on ongoing market opportunities

11- Increase internal productivity and efficiency due to correct data by 15%

12- Increase revenue by 10% from gaining new customers and customer satisfaction

13- Improve the value of the company to those who would acquire it by 10%

ROI – 5 Areas To Demonstrate Value

Data Migration

Data Integration

(1) Program

Strategy & Direction

Structure

Scope

Prioritization

Policy

Roles & Responsibilities

Authority & Accountability

Issue Resolution

Business Alignment

Power To Question

Transparency

Weight & Balances

CoE

Agility To Respond

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2)	Data	Management

Operations

Data Quality
Data Modeling
Metadata Management
Data Integration
Data Lineage
Security & Privacy
Data Standards
Business Rules
Business Process
Stewardship

Monitoring&Metrics

Reporting

Workflow Management

	(4) Business Operat
(3) Projects	Sales & Marketing
MDM	Customer Service
ВІ	Risk & Compliance
CRM	Order To Cash
CDI	Supply Chain
DW	Taxes & Fees
EDW	Social & Human Ser
DM	Mail & Transport
ERP	Asset Management
360 View	Dusiness Analytics

Business Analytics & Research

& Human Services

siness Operations

(5) Organization Strategy & Policy

Customer Definition

Merger & Acquisition

Planning & Budget

Business Partner Integration

Data Enrichment

Security & Privacy

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Oracle Data Governance ROI

Increase revenue / value of assets

□Improve the value of the company to those who would acquire it □Utilize information assets to make new sales, Better understand customers, Better understand product (and other) hierarchies

Reduce costs

Reduce <u>duplicate</u> data management processes (example: costs of data modeling, data administration, data quality)
 Reduce <u>errors</u> and associated costs (in software development, report development, information interpretation) due to lack of understanding of data or poor quality data

Support Compliance While Reducing Costs

Avoid audit fees due to lack of confidence in "authoritative data"Reduce costs of pre-audit testing

Support Impact Analysis

Provide a capability to <u>assess cross-functional impacts</u> of data-related decisions, to do useful impact analysis
 (by providing authoritative business rules, system of record information, and data lineage metadata)
 Avoid "undoing" work or rendering controls invalid



User Experience In Data Governance



A First Step Of User Experience





A Second Step Of User Experience





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Data Quality As Data Governance Foundation



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Failed BI&DW Projects

BI success is directly related to the quality of the underlying data from HC investment.



Overall BI&DW Project Success

Why EDQ?

		Abbreviations					А	Attributes non-standard, missing		
	Inconsistent formats	(often ambiguous)							or invalid	F
Customer ID	Customer Name	Address 1	Address 2	City	State	Zip	Country	Birth Date	Gender	
AD23298	Mr Peter Mayhew	9407 Main St		Fairfax	VA	22031-4001	USA	02/23/61	М	
VS38611	Dr Ellen Van Der Heijde	144 E Grove St		Kingston	PA	18704	US	07/12/57		
DC18223	Jalila Abdul-Alim (Do Not Call)	4548 Pennsylvania Ave	Apt 205	Kansas City	MO	64111-3349	USA	02/23/63	F	Widespread
CO9387A	Tayside Computers Inc. 3	4912 E 41st N		Idaho Falls	ID	83401	USA	31/03/2007	7	
TZ35019	Mr Zachary P Jahn	98-1731 Ipuala Loop	Aiea	Hawaii	96701	5	United States	06/12/86	Male	
CB27843	Mrs Edith Y Baba Junior	Baba Real Est. Corp. 3	209 Stony Point Trl	Webster	NY		USA	11/17/1971	м 6 Т	(often hard
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JP70210	Mr RJ & Mrs FB MacDonald	57 Hadleigh Close	Westlea	Swindon SN5 9BZ	MA	-	6	-	Y	to spor)
RD48107	Mr Andy Baxter	14 Oxbridge Wy		Milford	NH	3056	USA	01/01/01 8	М	



- **Compound Names**
- 2 Embedded Additional Information
- 3 Mixed Business & Personal Names
- 4 Multiple Names

	orders, invento
5	Mis-Fielded Data
6	Erroneous Data
7	International Date Formats
8	Default or Dummy Data



After EDQ ■ Before EDQ

Companies Individuals Products In one hour... In one hour... In one year... 240 businesses will change addresses 5,769 individuals in the US will change On average 20% duplicates in product data iobs 150 business telephone numbers will change or be disconnected 2,748 individuals will change address 90% product introductions fail Retailers lost 40 billion or 3.5% of 112 directorship (CEO, CFO, etc.) 515 individuals will get married changes will occur total sales lost each year due to item 263 individuals will get divorced info inefficiencies 20 corporations will fail 186 individuals will declare a personal 60% error rate for all invoices 12 new businesses will open their doors bankruptcy generated 4 companies will change their name Global Data Sync will realize 30% lower IT costs

Master data changes at rate of 2% per month

Compounded, 2% monthly change is 27% per year, 61% in two years, <u>104%</u> in three years!!!

Source: D&B, US Census Bureau, US Department of Health and Human Services, Administrative Office of the US Courts, Bureau of Labor Statistics, Gartner, A.T Kearney, GMA Invoice Accuracy Study

Why EDQ?

Variation or Error	Example				
Sequence errors	Mark Douglas or Douglas Mark				
Involuntary corrections	Browne – Brown				
Concatenated names	Mary Anne, Maryanne				
Nicknames and aliases	 Chris – Christine, Christopher, Tina 				
Noise	 Full stops, dashes, slashes, titles, apostrophes 				
Abbreviations	WIm/William, Mfg/Manufacturing				
Truncations	Credit Suisse First Bost				
Prefix/suffix errors	MacDonald/McDonald/Donald				
Spelling & typing errors	POrter, Beht				

Variation or Error	Example				
Transcription mistakes	Hannah, Hamah				
Missing or extra tokens	George W Smith, George Smith, Smith				
Foreign sourced data	Khader AL Ghamdi, Khadir A. AlGamdey				
Unpredictable use of initials	John Alan Smith, J A Smith				
Transposed characters	Johnson, Jhonson				
Localization	 Stanislav Milosovich – Stan Milo 				
Inaccurate dates	• 12/10/1915, 21/10/1951, 10121951, 00001951				
Transliteration differences	Gang, Kang, Kwang				
Phonetic errors	Graeme – Graham				



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ODI&EDQ


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	A1C 5X3	(525) 813 7072	(740)	(282)	PYC446898	Mr Reilly Shaw	34 Glencoe Drive	St. John's	NL 📃	
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	N2H 6M3	(697) 636 6472	535 4714	358 7537	PSU592898	Ms Makaila Sevigne	640 TRILLIUM DRIVE	KITCHENER	ON =	obl patterna Duafilar
	P1B 8K1	(122) 125 2385	286 3351		PTZ458898	Mrs Juliette Garrett	710 MCKEOWN AVE	NORTH BAY	ON	
	V8W 9V1	(852) 288 7982	139 8768	803 2263	PTL676898	Mr Jordan Sturgess	4000 SEYMOUR PLACE	VICTORIA	BC	📈 Quickstats Profiler
	XOA 1HO	(213) 907 8837	(361) 546 5849	(603)	PVC625898	Mr Cortez Herchy	APT # 302 PAUNA PLACE	IQALUIT	NT	
	K8V 5R5	(634) 511 8366	(222) 314 5047	(810)	PTV412898	Mrs Kassidy Queener	9 RIVERSIDE DRIVE	TRENTON	ON	Record Completeness Profiler
	M4K 3Z3	(831) 707 7808	/		PVD717898	Mrs Janessa Van Deventer	1032 Pape Ave	Toronto	ON	Record Duplication Profiler
	N85 4V1	(750) 207 5990	(209)		PVQ413898	Mr Colby Roberto	5745 WYANDOTTE ST E	WINDSOR	ON	
	V9R 5N3	(411) 780 3073	(1.2.2)		PYB574898	Mr Alec Kiddley	6250 HAMMOND BAY ROAD	NANAIMO	BC	🙀 RegEx Patterns Profiler
	M5K 1J5	(444) 189 2936	(129)		PUE649898	Mrs Angelina Merio	222 Bay St. TD Centre	loronto	ON	Count [
	V8W 9W6	(446) 834 2038	6/9//1/	(510)	PSW682898	Mr Maximus Balmin	2975 Jutiand Road, 2nd Floor	victoria	BC	Search
		(314) 903 3727	(693)	(510)	PXI/1602898	Mis Sarah Shien	250 Second Street	Midiand	ON	
		(009) 394 0403	4/0 0440		PTH4/0090	Mrs Alean Sankaranarayanan Mr Jakob Prandia	237 COTE-VERTO	JAINT-LAUKENT		
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	do not call	15108				HMW727725	Mrs Rebecca Koon	100 Airside Drive	MOON TOWNSHIP	PA			
	do not call	79720				YUQ599956	Mrs Lisa Baker	1001 N Birdwell Lane	BIG SPRING	TΧ		123 Number Profiler	
	do not call	65708				QMX547701	Mrs Karen Salas	10 Dairy Street	MONETT	MO		oN Delterre Dreffer	
	do not call	38305				PSE620551	Mr Blake Owens	1008 Old Hickory Boulevard	JACKSON	TN			
	do not call	35811				MHF413435	Mr Paul Robinson	1008 Oakwood Avenue	HUNTSVILLE	AL		📈 Quickstats Profiler	
	do not call	21030				XFV448872	Mrs Ruth Reese	10 North Park Drive	HUNT VALLEY	MD			
	do not call	15239				LFY468588	Mrs Helen Mills	1001 Millers Lane	PITTSBURGH	PA		ecord Completeness Profiler	
	do not call	64060				YKQ546540	Mr John Prater	1000 West 92 Highway	KEARNEY	MO		Record Duplication Profiler	
	do not call	33025				UMM550083	Mr David Harrison	1000 SW 84 Avenue	PEMBROKE PINES	FL			
	do not call	12701				WEH463268	Mr Marvin Pacheco	100 North Street	MONTICELLO	NY		RegEx Patterns Profiler	
	do not call	76177				HPA565680	Mrs Brenda Anderson	1005 Railhead Drive	FORT WORTH	TX			
	do not call	60030				QDB690101	Mr Stuart Foster	100 Library Lane	GRAYSLAKE	IL		Search	
	do not call	22812				132/31131	Mrs Temeka Halcomb	100 Quality Street	BRIDGEWATER	VA		Querra in the second se	
<u>.</u>	do not call	48043				LFR/15958	Mr Tristan Champers	10 North Main		MI		overview	
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Match					
Comparison Match Rules Re	lationships Matc	h Groups			
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- A Match Rule is simply the combination of comparison results
- Rules are evaluated in order and if one hits, we stop
- Rules can be 'negative' to eliminate pairs that are too different with a 'No Match' rule
- Rules can easily be turned on & off during the tuning process





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Why EDQ?

- Let's try the 'brute force' approach to **de-duplicating 10 million records**:
- Start at record 1 and compare it with:
 - Record 2, Record 3, ... , Record 10 million
- Now move onto record 2 and compare it with:
 - Record 3, Record 4, ... , Record 10 million
- This could take some time...
- The number of comparisons is about
 - Half of 10 million x 10 million, which is
 - 50,000,000,000,000!
- If a server can do 100,000 per second it will take
 - 500,000,000 seconds OR
 - 138889 hours OR
 - 15.85 years
- Which is rather too long to wait!
- So we need to work a bit smarter...

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EDQ Benchmark

Profile, Audit, Standardize, and Match 20m customer records in less than 7 hours on a single 6 core (3 pricing processor) server*

Benchmark Test	Time	Rate
Data Capture	9min	35,563 records/second
Profiling	1 hr, 30 min	3,536 records/second
Audit & Dashboard	7min	45,977 records/second
Cleanse	20min	16,474 records/second
Address Verification	5 hrs, 15min	1,059 records/second
Match	4 hrs, 27min	1,176 records/second
Siebel Batch Match	6 hrs, 59min	796 records/second

- 20million records (20 files of 1million records each)
- 6 core Intel/Windows box (3 processors for licensing purposes)



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Welcome, you are logged in as dnadmin.

Administration | Customise | Logout | Help

My Dashboard

Summarie	S					
Status	Name	Rules	Red	Amber	Green	
000	Customer Name	4	0	1	3	
• • • •	Marketability	4	1	0	3	
ر ر 🍋	Mailing Address	6	5	1	0	
000	Demographic Data	5	0	0	5	
• • • •	Compass Data Quality/Customer Name	6	3	2	1	

8.1.6(630)



Dashboard

Welcome, you are logged in as dnadmin.

Administration | Customise | Logout | Help

My Dashboard > Compass Data Quality/Customer Name

Rules						
Status	Name	Checks	Passes	Issues	Pass Rate	
•••	Last Name Check	100	48	48 (48%) 4 (4%)	48%	ah
د د 🗨	Title Check	100	81	17 (17%) 2 (2%)	81%	ah
د د 🗨	Salutation Check	100	85	■ 10 (10%) <mark>] 5 (</mark> 5%)	85%	ah
000	Multiple Names Check	100	91	■ 9 (9%) 0	91%	đh
000	Given Names Check	100	93	■ 7 (7%) 0	93%	đh
000	Business Name Check	100	94	■ 4 (4%) ■ 2 (2%)	94%	dh

8.1.6(630)



Welcome, you are logged in as dnadmin.

Administration | Logout | Help

My Dashboard > Compass Data Quality/Customer Name > Business Name Check



Metadata Management As Data Governance Foundation



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Analytical And Operational Data Integration Solutions



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Value Of Metadata Management



Metadata

1. Title - the title of the data object	
2. Creator - the person or entity responsible for creating the data object	
3. Subject - subject terms or keywords that describe the data object	
4. Description - a brief description, or abstract, of the data object	
5. Publisher - the entity responsible for making the data object available	
6. Contributor - a person or entity who contributed to the creation of the data object	
7. Date - data of creation, publication, or revision of the data object	
8. Type - the type of object. For data this would typically be "dataset"	
9. Format - a description of the format or file type(s) of the data object	
10. Identifier - a permanent identifier used to locate and identify the data object	
11. Language - the language(s) used within the data object (if applicable)	
12. Source - a relational element describing the lineage of the data object	
13. Relation - a relational element describing the relationship of this data object to other o collections, or entities	objects,
14. Coverage - describes the spatial and temporal context of the data object	
15. Rights - describes any rights, restrictions, or terms of use	

	Entity Name: Cu Alias Names: Ad	istomer ccount, Client				
Definition:	A person or an organization that purchases goods or services from the company.					
Remarks:	Customer entity includes regular, current, and past customers.					
Source Systems:	Finished Goods Orders, Maintenance Contracts, Online Sales.					
	Create Date:	January 15, 1999				
	Last Update Date:	January 21, 2001				
	Update Cycle:	Weekly				
	Last Full Refresh Date:	December 29, 2000				
	Full Refresh Cycle:	Every six months				
	Data Quality Reviewed:	January 25, 2001				
	Last Deduplication:	January 10, 2001				
	Planned Archival:	Every six months				
	Responsible User:	Jane Brown				
	Planned Archival: Responsible User: Figure 9-1 Metadata eler	Every six months Jane Brown ment for <i>Customer</i> entity.				

OEMM Architecture







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Analytical And Operational Data Integration Solutions

Operational Integration (Movement / Transformation) Metadata Harvesting (Glossary, Lineage & Impact Analysis) Hadoop HBase Adaptive CoSORT QlikView Oracle Database Oracle Exadata Altova ISO SQL Standard (DDL) SAP BO Crystal Reports Oracle Big Data Appliance Apache Hcatalog MapR Hadoop Hive SAP BO Designer Oracle TimesTen Apache Hive/HQL MicroFocus SAP BO Desktop Intelligence Microsoft Access SAP BO Repository Borland Oracle OLAP Microsoft Office Excel SAP BO Data Integrator Oracle Business Intelligence CA ERwin Oracle BI Applications Microsoft Visio SAP BO Data Steward Cloudera Impala Microsoft SQL Server Oracle E-Business Suite COBOL Copybook SAP Master Data Management Oracle JD Edwards Enterprise One DataStax Microsoft SSIS SAP Sybase PowerDesigner Microsoft Visual Studio • SAP Sybase ASE Database Oracle JD Edwards World Embarcadero SAS Data Integration Studio Oracle Fusion Applications EMC ProActivity Microstrategy

SAS BI Server

Magic Draw

OMG CWM Standard

OMG UML Standard

Oracle Data Integrator

Oracle Data Modeler

Oracle BI Enterprise Edition

Oracle Hyperion Applications

Oracle Hyperion Essbase

Oracle Warehouse Builder

Oracle BI Answers

Oracle BI Server

Oracle Database

Oracle Designer

Pivotal Greenplum

PostgreSQL

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Oracle DAC

- SAS Information Map
- SAS Metadata Management
- SAS OLAP Server
- Select
- Sparx Architect
- Syncsort
- Tableau
- Talend
- Teradata
- Tigris
- Visible
- W3C DTD & XSD Schema
 - + open APIs and standards based meta-model

- Hadoop Hive/Flume
- HP Enscribe
- HP NonStop
- HP Neoview
- Hypersonic SQL
- IBM DB2 i Series
- IBM DB2 UDB
- IBM DB2 z Series
- IBM Informix
- IBM Netezza
- JMS / MQ
- Microsoft Access
- Microsoft SQLServer
- MySQL
- Pivotal Greenplum
- PostgreSQL
- Salesforce.com
- SAP BW / BI
- SAP ERP / ECC
- SAS
- SQL/MP
- SQL/MX
- Sybase ASE
- Sybase IQ
- Teradata

- Oracle Governance Risk and Compliance
- Oracle Fusion AIA
- Oracle Retail Applications
- Oracle Agile BI / DW
- Oracle Agile PLM for Process
- Oracle iFlex FlexCUBE
- Oracle iFlex Mantas
- Oracle Hyperion Applications
- Oracle PeopleSoft
- Oracle Siebel CRM / OnDemand
- Oracle Communications
- Oracle WebLogic Server
- Oracle Coherence Data Grid
- Oracle SOA Suite
- Oracle Enterprise Service Bus

- GentleWare
- Google BigQuery
- Grandite
- Hadapt Hive
- Hortonworks Hive
- IBM Cognos
- IBM DB2
- IBM DataStage
- IBM Discovery
- IBM Federation Server
- IBM Lotus Notes
- IBM Netezza
- IBM Rational Rose
- IBM Rational Architect
- Informatica Metadata Mgr.
- Informatica PowerCenter

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Metadata Requirements Stack

Compliance Management / Needs Metadata Reg Information Accuracy

Performance Management / Needs Metadata Reg Information Consistency

> Process Management / Needs Metadata Reg Information Access

Business Intelligence/ Needs Metadata Reg Definitions & Relationships

Data Integration/ Needs Metadata Reg Processes & Objects

DataBase/ Needs Metadata Reg Data Schemas

Data Governance



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A (Wikipedia) Definition of Data Governance

"Data governance encompasses the people, processes, and information technology required to create a consistent and proper handling of an organization's data across the business enterprise."

Wikipedia



Data Definition, Production And Usage



Documenting Back





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Data Governance Teams



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Oracle Data Governance Maturity Levels







- 1. Project team submits a term to OEMM for registration
- 2. Admin receives and monitors this request info
- 3. The submitted item is routed to Data Stewards
- 4. Data Stewards work with the project teams to define terms and definitions
- 5. After definition submit for approval to the DG team
- 6. Term is approved by the DG voting members
- 7. Term is certified for use in OEMM registry & updated in OEMM Business Glossary



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Data Governance Test

- 1. Risk Management: We manage the risks associated with our data. My organization understands the need to quickly adjust to the risks associated with data, and many of these rules are coming from outside of the organization. We have a person, a staff of people, or council (or all of the above) that focuses on understanding all levels of risk around the management of data. The person/staff/council regularly communicates information about data risk so that everybody understands risky behavior versus safe behavior in how we handle our data.
- 2. Data Compliance & Regulatory Control: As an organization, we pay a great deal of attention to compliance and regulatory concerns around the data we collect, use, and share as part of making decisions and doing business. Somebody has the responsibility for documenting and communicating the rules to all individuals in the organization who handle these data. When we're audited, we can clearly demonstrate to the auditors that we follow the rules around the data.
- 3. Information Security & Data Classification: As an organization, we pay a great deal of attention to information security for all structured and unstructured data. We have an information security policy and/or something similar, e.g. guidelines, mandates. We feel comfortable with our ability to communicate, differentiate, and manage according to the rules associated with highly confidential data, internal-use data, and public data. People who share data in our organization also share the documented rules about that data, and we don't believe that information security is a concern.
- 4. Metadata Management: We have metadata for the most important data we manage. My organization knows what data we have, where that data resides, and how that data is defined, produced, and used in shared databases and on people's desktops. The information we have about our most important data is available to anybody who needs it. Just as important, we have identified and engaged people who have formal responsibility for the definition, production, and usage of metadata.
- 5. Data Quality Management: Our organization continually focuses on data quality. We have formal means for recording data quality issues, and we have proactive and reactive methods to find issues and address them when we find them. And we have people responsible for managing the issue logs, putting values to the issues and prioritizing the issues. Most important, we have a clear understanding about the business standards for core pieces of data that make it easier to differentiate high quality from low quality data.
- 6. Business Intelligence and Data Integration: We have a data warehousing environment that takes full advantage of the data therein and is used to its fullest capability. This means that people have easy access to the data, they understand the data, and they help us to continually improve the quality of the data. We recognize that data governance plays an important role in the success or failure of our data warehousing initiative on all sides of the data integration equation. We understand that data integration is a difficult discipline. But since we govern the data well on both sides—source and target—we feel comfortable with the effective nature of our business intelligence program.
- 7. Master Data Management: Our organization recognizes that master data management (MDM) is one of the most effective and most important data disciplines talked about today. We've identified people to manage our MDM initiative(s) and have started to identify the enabling technologies that will help us manage and share our master and reference data. When we populate our MDM environment, the discipline is there to manage the decision-making around the master data resource, the metadata component, and the communications and accessibility to the master data. We are positioned well to complete the master data initiative within budget and on schedule.
- 8. Data Governance & Data Stewardship: Last but not least, we have a data governance program that clearly defines roles and responsibilities at the operational, tactical, strategic, and support levels. Our program focuses on leveraging the existing knowledge of the data that lies within our data stewards. The approach we've taken has been embraced by our leadership, stewards, business, and the technology individuals and it addresses the governance of data in a proactive and reactive sense. Our data governance program is a primary contributor to our success in all of the disciplines listed in this







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Third Step In Oracle Data Governance - DRM

New Financial A	CCOUNT perty values for Oracle General Ledger.				R	
Request Items (3)		🕞 Vision Currer	t Period		Add	
Name	Description	Hierarchy	Task	Action		
1 6200	Compensation Expenses	Parent Total	Add Financial Account			
2 6210	Paid Vacation Expenses	Parent Total	Add Financial Account	¥	-	
Name	6160	61	6160			
* Description	Other Compensation	Ot	Other Compensation			
Parent	Parent Total~6000	Par	ent Total~6000	122		
* Account Type	Expense	Exp	Expense v			
* Allow Budgeting	True					
* Allow Posting	True				1	
* Enabled	True					
Start Date	2/15/2012	2/1	2/15/2012 🗸			
End Date		3/1	/2013	×	09	
Financial Category Employee benefits related expenses			Employee benefits related expenses			

Request Items (9))	🗟 Vision Jan 2013 - Gi	les						
Name	Description	Hierarchy	Task					1	5
1 P_161	Tablet Standard	Total Product	Add Proc	JUCE		10	17		
2 P_160	MyPad Tablet	Total Product	Add Proc	suct Cat	egon	Y			
3 P_170	Sentinel Server	Total Product	Add Proc	Juct Cat	egon	Y			
4 P_180	Envoy Desktop Septial Standard	Total Product	Add Prot	Diroct Cat	Cate	y ann			
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JStein (2/6/2013 12:35:37 AM) - Pushed Back to Stage 'Specify Product Changes' JStein (2/6/2013 12:35:28 AM) - 回退修改



Enforcing Data Governance

		DG Council	DG Team	Domain DG Team	Operational DG Team
	Obtain the position job description from HR	I	R/A	R	R
Identification& Documentation	Identify the data touch points associated with position	I	R/A	R	R
	Identify the rules associated with data		R/A	R	R
	Attach accountabilities to data touch points	I.	R/A	С	С
Ratification	Communicate accountabilities associated with data	I	R/A	I	I
	Enforce accountabilities associated with data		R/A	С	R
mplementation&	Measure accountabilities associated with data	I.	R/A	С	I.
	Measure accountabilities associated with data	I	R/A	С	1

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Data Governance Best Practices



ROI – 5 Areas To Demonstrate Value

Data Migration

Data Integration

(1) Program

Strategy & Direction

Structure

Scope

Prioritization

Policy

Roles & Responsibilities

Authority & Accountability

Issue Resolution

Business Alignment

Power To Question

Transparency

Weight & Balances

CoE

Agility To Respond

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2)	Data	Management

Operations

Data Quality
Data Modeling
Metadata Management
Data Integration
Data Lineage
Security & Privacy
Data Standards
Business Rules
Business Process
Stewardship

Monitoring&Metrics

Reporting

Workflow Management

	(4) Business Operat
(3) Projects	Sales & Marketing
MDM	Customer Service
ВІ	Risk & Compliance
CRM	Order To Cash
CDI	Supply Chain
DW	Taxes & Fees
EDW	Social & Human Ser
DM	Mail & Transport
ERP	Asset Management
360 View	Dusiness Analytics

Business Analytics & Research

& Human Services

siness Operations

(5) Organization Strategy & Policy

Customer Definition

Merger & Acquisition

Planning & Budget

Business Partner Integration

Data Enrichment

Security & Privacy

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Oracle Data Governance ROI

Increase revenue / value of assets

□Improve the value of the company to those who would acquire it □Utilize information assets to make new sales, Better understand customers, Better understand product (and other) hierarchies

Reduce costs

Reduce <u>duplicate</u> data management processes (example: costs of data modeling, data administration, data quality)
 Reduce <u>errors</u> and associated costs (in software development, report development, information interpretation) due to lack of understanding of data or poor quality data

Support Compliance While Reducing Costs

Avoid audit fees due to lack of confidence in "authoritative data"Reduce costs of pre-audit testing

Support Impact Analysis

Provide a capability to <u>assess cross-functional impacts</u> of data-related decisions, to do useful impact analysis
 (by providing authoritative business rules, system of record information, and data lineage metadata)
 Avoid "undoing" work or rendering controls invalid



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Data Governance Best Practices



The Data Governance Process







Data Governance Best Practices



Data Governance Matrix

		п				Marketing		HR
1. Customer Data	System Name	Domain Steward	Operation al Steward	Data Gov Team Member	Area 1		Area 1	
1.1. Customer Address Data	ERP System							
	MDM DB							
	EDW DB							
1.2. Customer Demographics Data								
	ERP System							
	MDM DB							
	EDW DB							
1.3. Customer Financial Data								
	ERP System							
	MDM DB							
	EDW DB							



Critical Data Elements in OEMM

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Business Glossary Stewardship Workflow

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Business Glossary Manages Definitions

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Mapping of Business Term to Rules

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Capture Business Rule Definitions

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Semantic Linking of Business Rules

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			Possible Values:	Vehicle Registration	A			Candidate		
Term to Rule Linking				Identity Card Character Act of Parliament	•		Critical Data Elem	Yes 👻	Remediation & Repair	
			Default Value:		~					
	Bookmarks			Character Act of Parlia	ament				2 Koy Lleare	
Allowable Values	T (None)			Identity Card	icel				3 Key Users	
				Vehicle Registration						
Search and Browse									3 Kinds of Lineage	
Data Flow Lineage									3 rd Party Integrations	
Model Versioning		Q. 19						▲ 🕞 🔁 🕼 7:02 AM 5/14/2015	Deployment Architecture	
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Model Level Versioning Shows Object Level Changes

	Oracle Enterprise Metadat ×				Person 1 👝 🗊	
Critical Data Elements	$\leftrightarrow \rightarrow$ C D localhost:11580/MM/				52	Model Browser
	ORACLE: Enterprise Metadata Management 12c					
	Repository Q 🖸 🛇	A Home × OBIA Sales Repor × PAYTRANS ×	PAYTRANS ×			
Business Glossary		Metadata Browser	Comparison Report \times		Q 🗞 🕫 👅 🔳	Systems Lineage
	+ B DB - OLTP Source	< > □ ⊕ < ★ < ≡	<i>≈</i> ≡ ≡		★ ~	
Stewardship Workflows	+-Q Load to Dimensional DW 	- B PAYTRANS (DataModel)	Comparison Report for PAYTRANS - version	on v2 and the previous version	2014-11-24 08:55:45	Data Profiling
·	└ ✓ 2014-12-04 13:42:18	- By Subject Areas	Object	Change This	Model Comparing Model	Ŭ
	+ V Semantic Mapping from Sales Glossary to BISAMPLE (Relational Mod		PAYTRANS/PAYTRANS/			
Business Rule Definitions	🚽 📷 Metadata Management	+ PAYTRANS (File Directory)	PAYTRANS			Data Validation
	Finance System		PTAMT	Type length 10	8	
Rule Semantics	- 📄 1 - Operational Data Stores					Dashboards
	Enterprise Application Integration					Dushibourus
	Open					
Term to Rule Linking	_⊕ Q Search					Remediation & Repair
	+ to PA ✓ Unset Default					
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Allowable Values	Acciun X Delete					3 Key Users
	Adj str > Renaine	version				
Search and Browse	Bookmarks					3 Kinds of Lineage
	T Configurations	Compare with Compare version with another version				Ŭ
	Data Lineage					
Data Flow Lineage						3 rd Party Integrations
Model Versioning						Deployment
						Architecture
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					and company	Information Assets

Vertical Lineage = Business Term to Technical Column



Horizontal Lineage = Report to Source Column / Field Level

	agement 12c Administrator V Tools V Help V					
Critical Data Elements	X P SOL X P Hive X Employee Report X C SOL To Hive X D Configuration Lin X Properties	Model Browser				
	Name Value					
	Configuration Model Manager Architecture Diagram Q V M =					
Dusiness Classen		Business & Systems				
Busiliess Glossaly	Creation Time 2015-05-19 10:12:29	Lineage				
	Author					
	Last Modification 2015-05-19 10:49:28	Data Profiling				
Stewardship Workflows	Modifier					
	Steward					
	Path /Data Lineage Demo/Configu					
Business Rule Definitions	Data Lineage (with control links and internal objects) for 📰 Page (Page) in Configuration Configuration_Lineage					
		Data validation				
Rule Semantics						
	Body -	Dashboards				
Term to Rule Linking	SOL	Remediation & Repair				
	Employee_Report CurrentFlag CurrentFlag					
	Gender - Gender Gender					
	HireDate HireDate HireDate	3 Key Users				
Allowable Values	JobTitle JobTitle JobTitle					
	LoginID					
	MaritalStatus — MaritalStatus — MaritalStatus					
Search and Browse	ModifiedDate ModifiedDate ModifiedDate	3 Kinds of Lineage				
Search and Browse	NationalIDNumber NationalIDNumber NationalIDNumber	0.1				
Data Flow Lineage	OrganizationLevel OrganizationLevel OrganizationLevel					
	OrganizationNode OrganizationNode OrganizationNode	and Devis Later setting				
		3 rd Party Integrations				
	Salaheoriag					
Model Versioning	VacationHours VacationHours VacationHours	Doploymont				
		Deployment				
		Architecture				
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Data Profiling



Data Validation Against Business Rules



Data Quality Dashboard

Critical Data Elements	Sqljdbc4.jar dowr × C Oracle Enterprise × Edit the Data Mai × Y Oracle EDQ Onlin × Y Concepts ← → C P Iocalhost:9002/edq/faces/dashboard/dashview ORACLE: Enterprise Data Quality Dashboard	× 💭 UPK - EDQ 12.1.3 × Y 🖉	🧿 Enterprise Data 🔾	× C Oracle EDQ Or	nlir x - 0 x	Model Browser
Business Glossary	Home > Demo2015/Quality of Customer Data				Normal Administration 🕥	Systems Lineage
Stewardship Workflows	Rules View - Image: Detach Status Name Omage: Detach	Checks	Passes	Issues	Pass Rate	Data Profiling
Business Rule Definitions	Demo2015/Quality of Customer Data Email Format in the field 'E-mail Address' Demo2015/Quality of Customer Data Data in the field 'First Name' Demo2015/Quality of Customer Data	4640 4640 4640	4362 4636 4640		94% 99.9% 100%	Data Validation
Rule Semantics						Dashboards
Term to Rule Linking						Remediation & Repair
Allowable Values	Real-time Aggregations					3 Key Users
Search and Browse						3 Kinds of Lineage
Data Flow Lineage	Copyright © 2006, 2014, Oracle and/or its affiliates. All rights reserved.				Privacy Statement	3 rd Party Integrations
Model Versioning					▲ [P 惶 (1)) 3:37 AM 5/21/2015	Deployment Architecture
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Data Remediation and Repair

	Case Management - BUS_VENDOR_TYPE_INVALID:35	Model Browser
Critical Data Elements	Back to List Image: Control Showing 7 of 39 Image: Control Showing 7 of 39 <thimage: 7="" control="" o<="" showing="" td=""></thimage:>	
Business Glossary	Summary Details - Investigation Current State Image: Current State Image: Current State Image: Current State	Systems Lineage
Stewardship Workflows	State Changed By System User Working Records State Changed On 19/02/15 11:34 Supplier Available Actions R1 VENDOR_INTERFACE_ID 35 VENDOR_NAME BASHINGTON DEPARTMENT OF REVENUE	Data Profiling
Business Rule Definitions	Change State VENDOR_TYPE_LOOKUP_CODE Change Assignment Change Assignment Change Assignment Change Assignment HOLD_UNMATCHED_INVOICES_FLAG HOLD_ALL_PAYMENTS_FLAG N HOLD_ALL_PAYMENTS_FLAG N	Data Validation
Rule Semantics	Add Comment Iternis_name Add Attachment VAT_REGISTRATION_NUM Summary PARTY_ORIG_SYSTEM	Dashboards
Term to Rule Linking	Id DAT-48879 Key BUS_VENDOR_TYPE_INVALID:35 Assigned To LAST_UPDATE_DATE LAST_OPD NAME AUT	Remediation & Repair
Allowable Values	Created By System User Created On 19/02/15 11:34 Priority Medium Review Flag Relationships	3 Key Users
Search and Browse	Description Vendor type is invalid Escalation false Priority Score 80 Risk Score Related Record Rule Name	3 Kinds of Lineage
Data Flow Lineage	List Record Type Vendor Type is invalid Screening Mode Fix at Source/Fix: Pick value fro Audit Log - Full History	3 rd Party Integrations
Model Versioning		Deployment Architecture

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Deployment Architecture



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