



Global IDs

A Case Study

Benefits of Global IDs enabling the business

Executive Summary

- ❖ A large financial organization was in the process of inventorying data sources, vendors and data assets
- ❖ Next logical step was to establish the Data Governance organization
- ❖ Efficient Data Governance required a platform specifically built to address data inventory, data quality and data governance questions
- ❖ Global IDs was evaluated using a key business process
 - The outcome highlighted the functionality Global IDs brings to the table that is beneficial across several aspects of data governance:

Transparency

- Centralized business term repository across the organization
- Centralized data inventory
- Support for data migration initiatives

Traceability

- Centralized data view: profiling, mapping and quality assessment
- Centralized view of the data flows between applications

Trust

- Data quality monitoring, including datasets delivered by 3rd parties
- Outbound data quality monitoring
- Data Quality issue resolution workflow

A Case for One-Company-Data

- ❖ The company was in need to take control of its data assets
- ❖ A company-wide Data Governance Program with appropriate tools was needed
- ❖ Legacy “siloes” business and technology philosophy clearly manifests itself in process and data
 - Discrepancies in business terminology
 - Multiple duplicative databases and data sources
 - Unknown or non-existing data flow documentation
 - Unknown and undocumented data lineage
 - Unknown/undocumented data consumers and usage patterns
- ❖ High cost of data operations
- ❖ Lost revenue opportunities due to unreliable information about the data

A data governance framework with a single set of rules and processes for collecting, storing, and using data

The Data Governance program should address:

- People
- Processes
- Contributors (to Data Pipeline)
- Technology

A Case for One-Company Global IDs Adoption

- ❖ Global IDs is a platform that is built to help organizations regain control of and gain trust in their data assets
- ❖ Facilitates use of Common Business Terminology
- ❖ Facilitates disciplined approach to Data Governance
- ❖ Goes straight to the source – Global IDs directly connects to databases and evaluates real data
- ❖ Facilitates all aspects of Data Governance:
 - Transparency (Where is the data?)
 - Traceability (How is data flowing?)
 - Trust (How reliable is data?)
 - Analytics (Are we deriving value from data?)
 - Privacy (Is sensitive data protected?)
- ❖ Ultimately reduces cost of data operations
- ❖ Opens new revenue opportunities by providing answers to business data-related questions quickly and with authority

A data governance framework with a single set of rules and processes for collecting, storing, and using data.

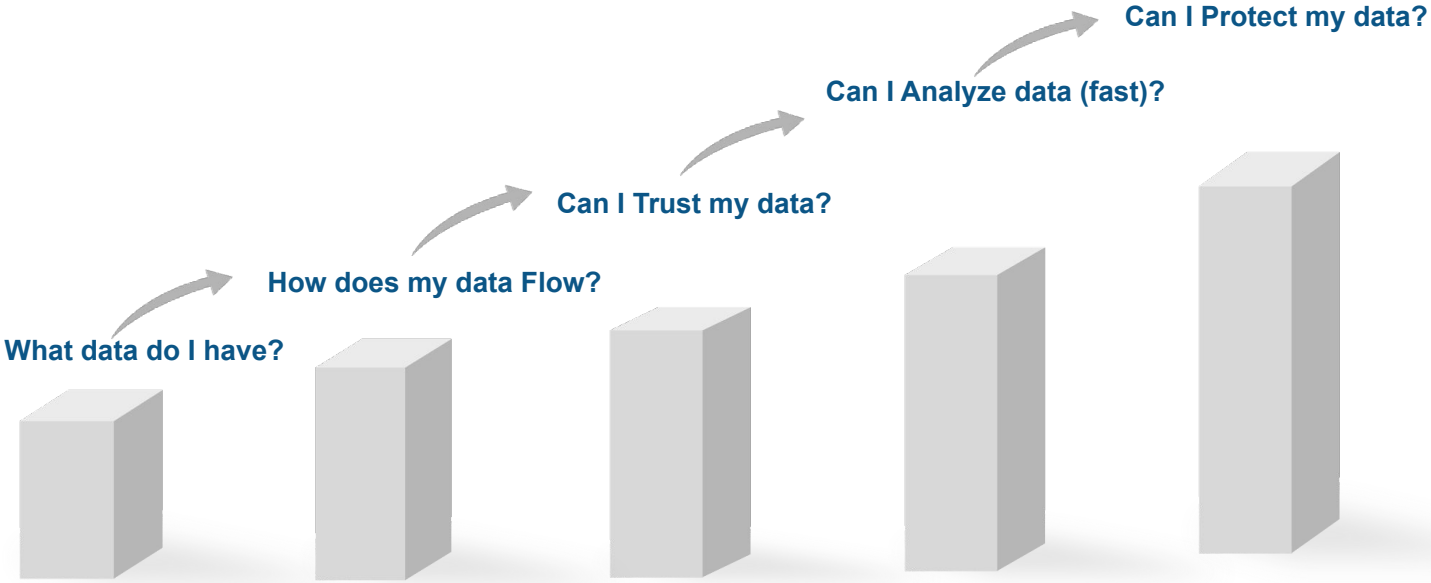
The Data Governance program should address:

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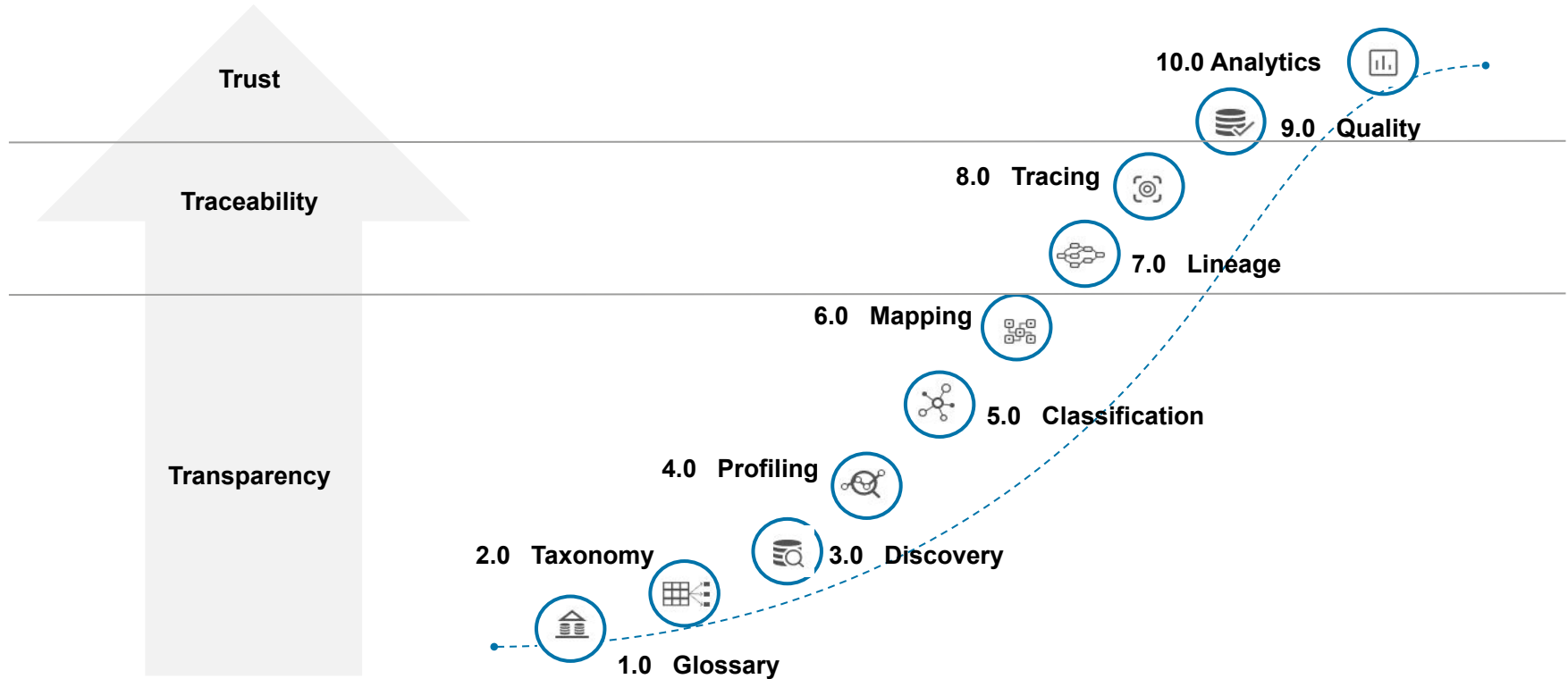


Global IDs

The Company needed to answer key data questions that could not be answered previously.



Global IDs Data Governance methodology is a 10 step process enabling value



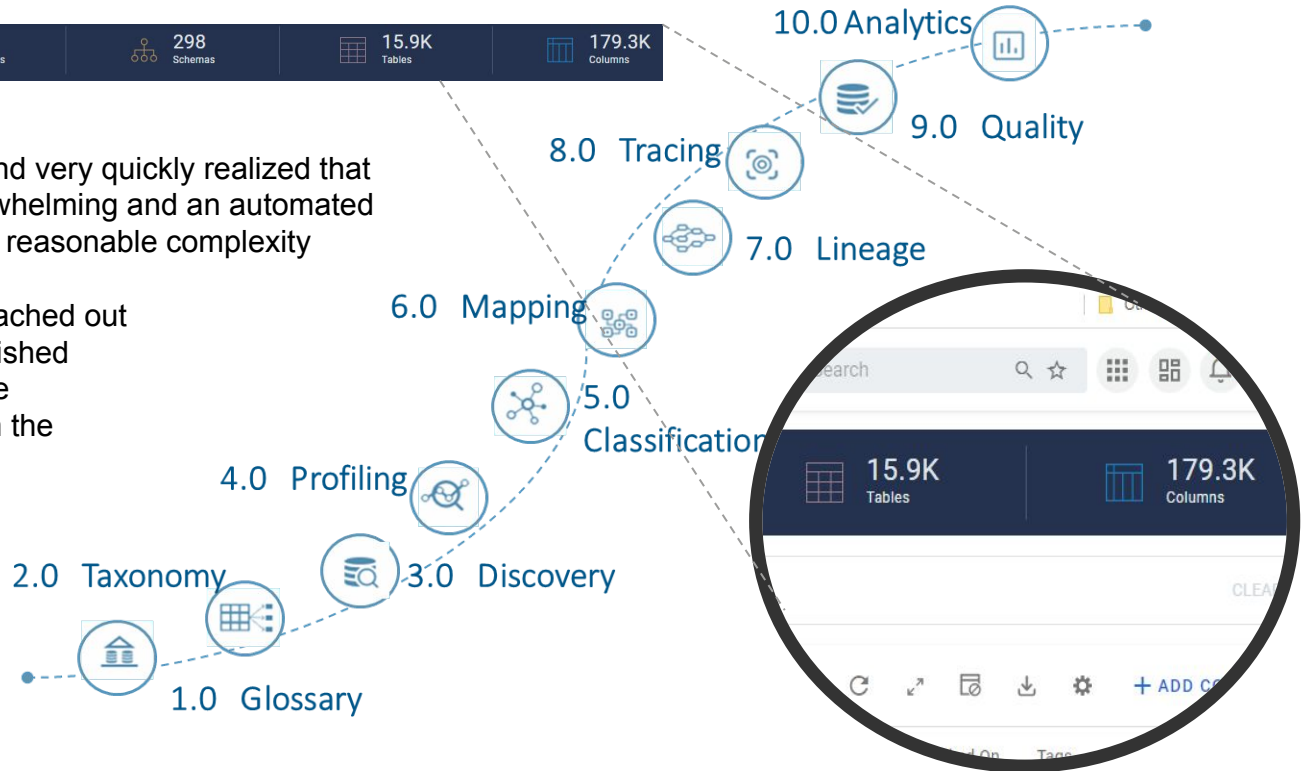


Transparency □ Traceability □ Trust
Journey

Data Discovery Journey



- The team started **at step 3** and very quickly realized that the amount of data was overwhelming and an automated taxonomy was a task beyond reasonable complexity
- They went back to **step 1**, reached out to domain experts and established business data objects that are “important to business line” in the context of a specific business process



The importance of speaking the same language



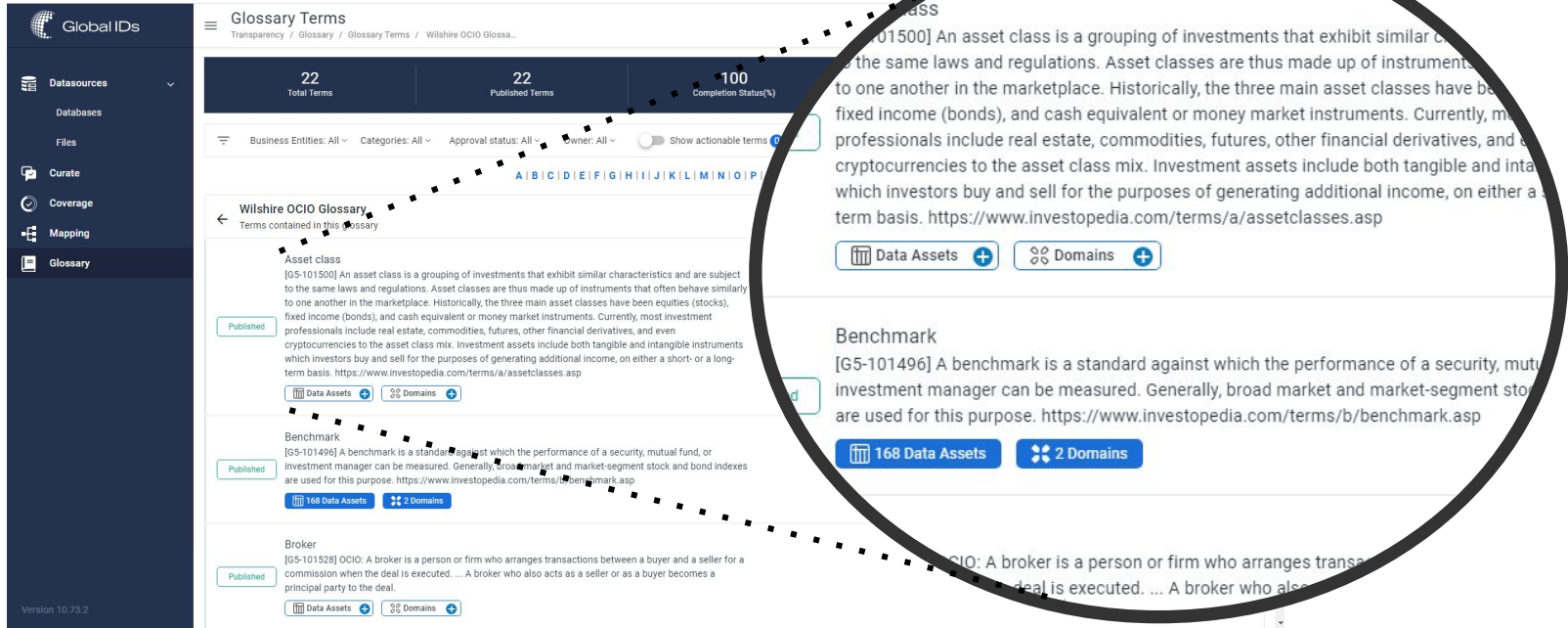
Scenario

- Lack of a common business ontology
- Lack of a common business ontology documented (neither a system to maintain one)
- Discrepancies in business terminology between business units

Global IDs

- ★ Glossary functionality allows one or multiple Business Terminology Glossaries with agreed upon definitions.
- ★ Glossaries are integrated and can be used to create metadata entities in the system
- ★ Glossaries can be imported
 - Public domain/industry standards (eg: FIBO)
 - Company-specific (Excel, etc.)

Example – Business Glossary Term



The screenshot displays the 'Global IDs Glossary Terms' interface. On the left is a dark sidebar with navigation options: Datasources, Databases, Files, Curate, Coverage, Mapping, and Glossary. The main content area shows a 'Glossary Terms' header with filters for Business Entities, Categories, Approval status, and Owner. A progress bar indicates 22 Total Terms, 22 Published Terms, and 100% Completion Status. Below this is a list of terms under the heading 'Wilshire OCIO Glossary'. The terms listed are 'Asset class', 'Benchmark', and 'Broker'. Each term entry includes a 'Published' status, a definition, and buttons for 'Data Assets' and 'Domains'. A large black circle highlights the 'Asset class' and 'Benchmark' entries, with dashed lines connecting the circle's edge to the corresponding text in the image.

Asset class
[G5-101500] An asset class is a grouping of investments that exhibit similar characteristics and are subject to the same laws and regulations. Asset classes are thus made up of instruments that often behave similarly to one another in the marketplace. Historically, the three main asset classes have been equities (stocks), fixed income (bonds), and cash equivalent or money market instruments. Currently, most investment professionals include real estate, commodities, futures, other financial derivatives, and even cryptocurrencies to the asset class mix. Investment assets include both tangible and intangible instruments which investors buy and sell for the purposes of generating additional income, on either a short- or a long-term basis. <https://www.investopedia.com/terms/a/assetclasses.asp>

Benchmark
[G5-101496] A benchmark is a standard against which the performance of a security, mutual fund, or investment manager can be measured. Generally, broad market and market-segment stock and bond indexes are used for this purpose. <https://www.investopedia.com/terms/b/benchmark.asp>

Broker
[G5-101528] OCIO: A broker is a person or firm who arranges transactions between a buyer and a seller for a commission when the deal is executed. ... A broker who also acts as a seller or as a buyer becomes a principal party to the deal.

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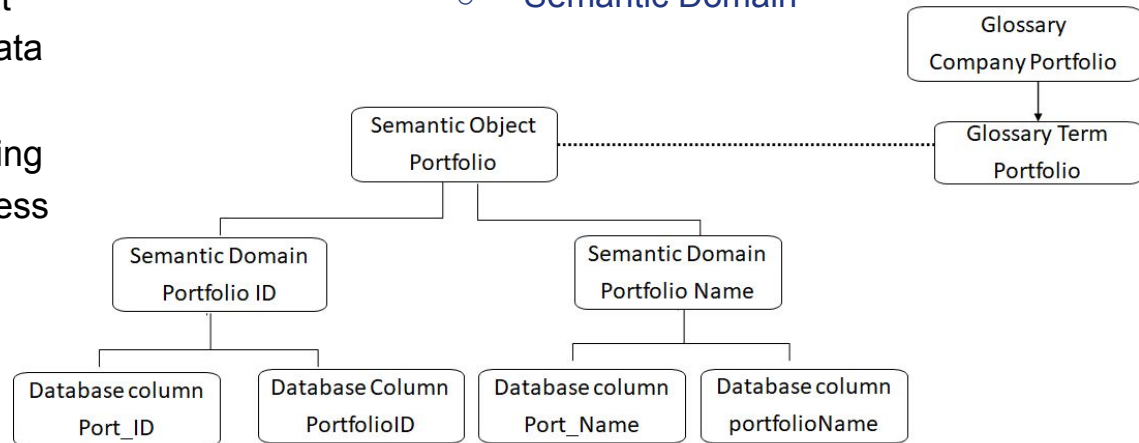
Systematic representation of business terms

Scenario

- Created in isolation, databases do not share the same “technical terminology” discipline when it comes to naming table and data elements
- There is no conceptual mapping of data elements to the business domains/terms

Global IDs

- ★ Global IDs introduces concepts of
 - Semantic Object
 - Semantic Domain



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Example – Company Semantic Objects

2.0 Taxonomy

The screenshot displays the 'Global IDs' Mapping interface. The left sidebar contains navigation options: Datasources, Databases, Files, Curate, Coverage, Mapping, and Glossary. The main content area is titled 'Mapping' and shows a list of semantic objects. Each object has a header with counts for CHILD OBJECT, DOMAINS, TABLE, FILE, COLUMN, and VARIANT. Below the header is the object name and a description. A magnifying glass highlights the 'OCIO Asset Class' entry, showing its details: 0 CHILD OBJECT, 1 DOMAIN, 0 TABLE, 0 FILE, 0 COLUMN. The description for 'OCIO Asset Class' is: 'OCIO: Today this idea of what category "assets" live differs by portfolio manager spreadsheet. Some examples it has no name, one has "category", one has "name"..'. Below the description are buttons for 'Asset Class ID', '+ Associate Domains', and 'Recommend More'. Other visible entries include 'OCIO Sub-sub-asset class' (2 DOMAINS), 'OCIO Benchmark' (1 DOMAIN), and 'OCIO Portfolio' (2 DOMAINS).

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Looking into the real databases



Scenario

- Organized a DBE working group with broad business entity and process coverage:
 - ◆ All business entities represented
 - ◆ N CompanyX applications covered
 - ◆ Connected to M databases
 - ◆ Identified NNN DB Schemas
 - ◆ Discovered NNNNN tables
 - ◆ Looked at NNNNNN data elements


Global IDs

- ★ **Read-only** access to live production tables
- ★ Ability to query database schema
- ★ Automatic data classification
- ★ Automatic data sampling and quality assessment

And more...

 8
Business Entities

 21
Applications

 20
Databases

 298
Schemas

 15.9K
Tables

 179.3K
Columns

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Looking at the real data



4.0 Profiling

Scenario

- No standard tools to profile data elements
- Custom scripting to QA data and address data issues
- DBEs are taking on operational roles
- No centralized program for data quality monitoring

Global IDs

- ★ Centralized view of all data elements
- ★ Various quality characteristics
- ★ Real-time information, updated as data is processed/received
- ★ Feedback system allowing users to correct systems' automated decision making

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Example – Data Element Profiling



4.0 Profiling

Global IDs

Profile
FMG / Database Server/SSI... / FMGDEV01 / fromDavidZee / dbo_CE_1Q18 / Previous Market Value / Profile

← SUMMARY

Column Name: Previous Market Value
Total Records: 1.6K | Unique Values: 1.4K(91.79%) | Inferred Datatype: Decimal | Documented Datatype: n
Profiled Records: 1.6K | Duplicate Values: 65(4.17%) | Distinct Formats: 30 | Domain: Performance

Add Tag +

DATA TYPE

Previous Market Value

Data Type	Occurrence	Feedback
NUMBER	1497 (95.96%)	<input checked="" type="checkbox"/> <input type="checkbox"/> <input style="background-color: #007bff; color: white; border: none; padding: 2px 5px; border-radius: 3px;" type="button" value="?"/>
DATE	0 (0%)	<input checked="" type="checkbox"/> <input type="checkbox"/> <input style="background-color: #007bff; color: white; border: none; padding: 2px 5px; border-radius: 3px;" type="button" value="?"/>
TEXT	0 (0%)	<input checked="" type="checkbox"/> <input type="checkbox"/> <input style="background-color: #007bff; color: white; border: none; padding: 2px 5px; border-radius: 3px;" type="button" value="?"/>

● NUMBER ● DATE ● TEXT

FORMAT (LENGTH + PATTERN)

WORD ANALYSIS

COMPLETENESS ANALYSIS

ENCODING PARAMETERS

CHARACTER DISTRIBUTION

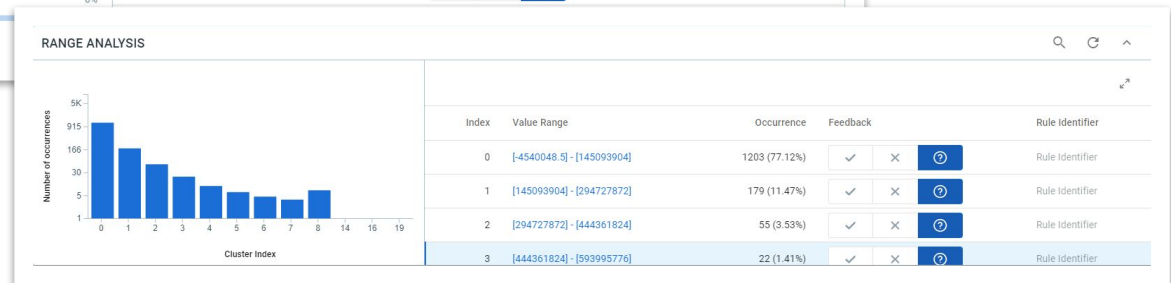
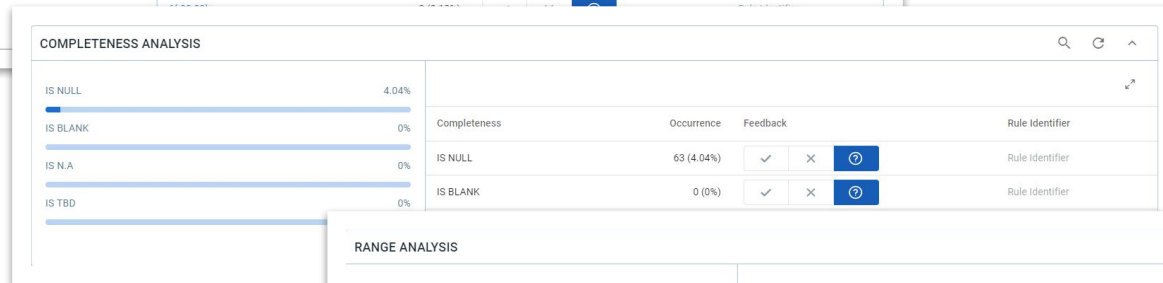
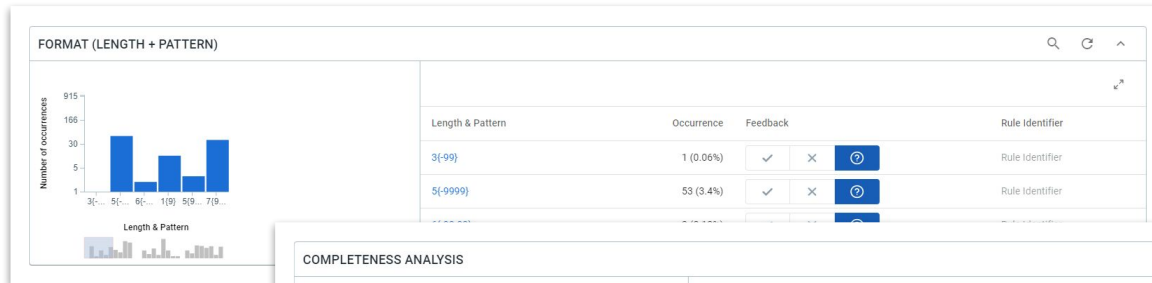
Version 10.73.2

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Example – Data Element Profiling – contd.



4.0 Profiling



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Automatic domain curation with user guidance



5.0 Classification

Scenario

- Currently no reliably documented mapping between table columns and business data domains exists

Global IDs

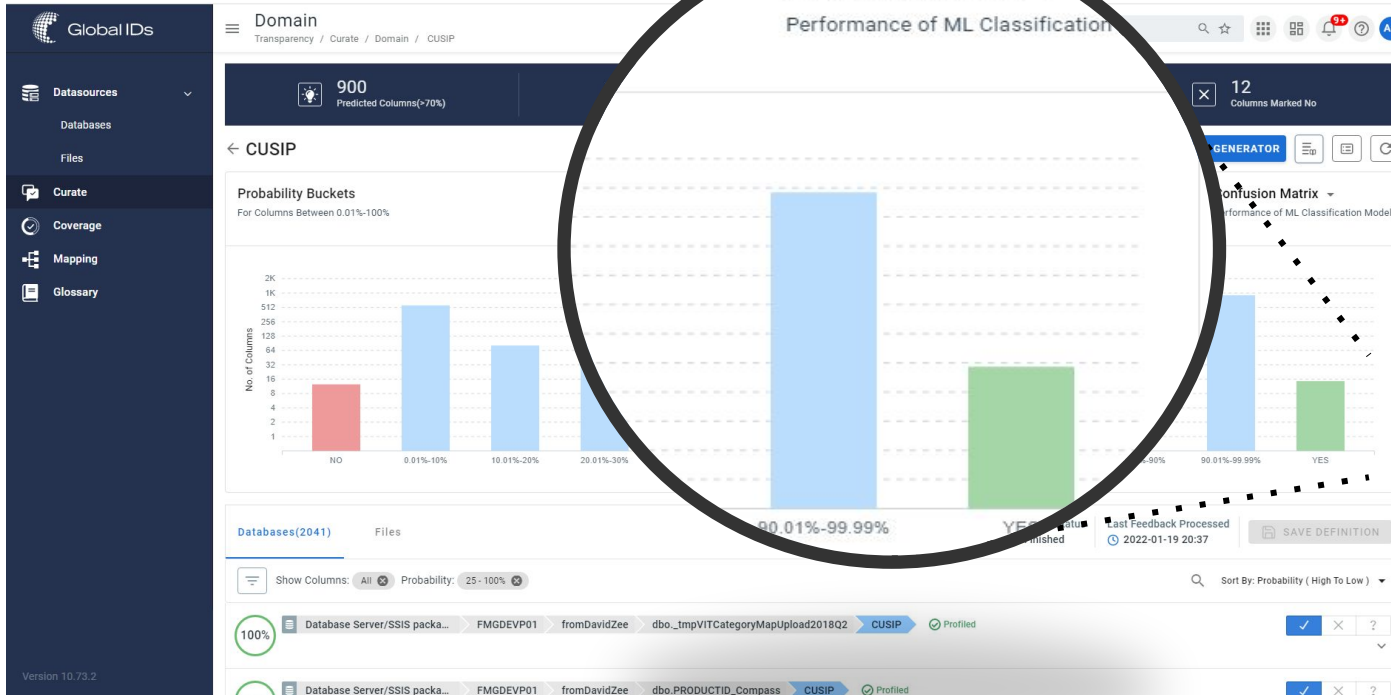
- ★ AI-based, automatically proposed mapping between database columns and semantic domains
- ★ User curation functionality supporting further reinforced learning
- ★ “Confidence level” mapping
- ★ Rapid feedback “Gaming” console

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Example – Classification Engine



5.0 Classification



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Example – Classification Engine – user feedback



5.0 Classification

Global IDs

Domain

Transparency / Curate / Domain / CUSIP

Databases(2041) Files

Feedback Status: Finished

Last Feedback Processed: 2022-01-26 16:05

SAVE DEFINITION

100%

Funds Management FMGDB05 FIPS_db dbo.tblGuaranteedInvestments CUSIP Profiled

49327E508 852321108 478033863 49327E300 852320118 039480108 49327E102 64953ABM1 74686Q207 852320159 202919403 74686Q579

← CUSIP

RAPID FEEDBACK DOMAIN RULE GENERATOR

Rapid Feedback Gaming Console

FEEDBACK - YES: 9 NO: 3 CLASSIFICATION ACCURACY 75%

0% 100%

is this column related to this Business Concept / CDE

CUSIP An Example Of CUSIP

Table: WIRP_SecurityLevelAPI

PREVIOUS NO YES NEXT

Values

GCZ21--4

CLX21--0

NOACBOND9

CZ21--6

CLF22--9

Patterns

ZZZ99--9

ZZZ99ZZZ9

ZZZZZZZZ9

ZZ99--9

ZZ.99999

Correlated Columns

IndexId

IndexDescription

Expiration

AssetNM

DailyReturn

Proximate Domains

fundno

Asset Class

net expense

AssetClass

RegulatoryAgency

Default | Found in reference data | Absent from reference data | Potential DQ error

Version: 10.7.3.2

99%

Database Server/SSIS packa... FMGDEV01 fromDavidZee dbo.MstarRaw_ETF CUSIP Profiled

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Transparency

We were able to consolidate metadata information in one place and map it to business domain terminology

- Business Ontology
- Semantic Objects
- Semantic Domains
- Database Columns
- Database Tables

Which business questions can we answer now?

- Where is my data?
- What database tables contain information about specific Business Object?
- What characteristics represent a specific Business Object?

Business concepts to database tables and fields mapping



6.0 Mapping

Scenario

- Currently no reliably documented mapping between table columns and business data domains exists

Global IDs

- ★ Semantic Objects (representing Business Terminology) are mapped to Semantic Domains (Representing Data Objects)
- ★ Semantic Domains are mapped to actual Data Columns of the Database Tables

E.g.:A business term **Portfolio** is represented by a semantic object **Portfolio**, which is represented by semantic domains of **Portfolio ID** and **Portfolio Name**, which are mapped to individual table columns

Example – Mapping Engine



6.0 Mapping

Global IDs

Mapping

OCIO: Today this idea of what category "assets" live differs by portfolio manager spreadsheet. Some examples it has no name, one has "category", one has "name"...

Asset Class ID + Associate Domains Recommend More

Thomas Corning | Owner

Thomas Cor. | Created 2 months ago

0 CHILD OBJECT | 1 DOMAIN | 0 TABLE | 0 FILE | 0 COLUMN | 0 VARIANT

OCIO Benchmark

OCIO: A benchmark is a standard or measure that can be used to analyze the allocation, risk, and return of a given portfolio. Individual fund and investment po...

OCIO Portfolio

OCIO: Portfolio is a collection of assets held by an client / customer. GENERAL: A portfolio is a collection of financial investments like stocks, bonds, com...

Portfolio ID Portfolio Type + Associate Domains

0 CHILD OBJECT | 2 DOMAINS | 0 TABLE | 0 FILE | 0 COLUMN | 0 VARIANT

OCIO Client

OCIO: Client - legal entity at a MSA level doing business with Wilshire GENERAL: The person or organization to whom an agent owes duties of integrity, confide...

Client ID Clientidenti... Client + Associate Domains Recommend More

Thomas Corning | Owner

Thomas Cor. | Created 2 months ago

Anatoli Ar. | Edited 14 days ago

0 CHILD OBJECT | 2 DOMAINS | 0 TABLE | 0 FILE | 0 COLUMN | 0 VARIANT

OCIO Add Tag

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Example – Mapped Tables (SOME Security)



6.0 Mapping

The screenshot displays the 'Mapped Tables' interface in the Global IDs application. The left sidebar contains navigation options: Datasources, Databases, Files, Curate, Coverage, Mapping (highlighted), and Glossary. The main area shows a breadcrumb path: Transparency / Mapping / Mapped Tables / OCIO Security. A summary bar indicates 3 Associated Domains, 701 Mapped Tables, 0 Mapped Files, and 1.5K Mapped Columns. A dropdown menu is open for 'OCIO Security', showing a list of mapped tables with columns for Name, Status, Confidence(%), and Schema. A search sidebar on the right is also open, listing various filters like Business Entity, Application, Database, Schema, Domain, Identifier, and SEDOL. A dashed line highlights a specific table entry in the main list.

Name	Status	Confidence(%)	Schema
TRANSACTIONS	-	90	INVESTCLOUD
SMFIXEDINCOME	-	90	INVESTCLOUD
SMCOMMON	-	90	INVESTCLOUD
PROFITLOSSLITE	-	90	INVESTCLOUD
prc.PrcScChg_changes	-	90	QAI
prc.PrcScChg	-	90	QAI
prc.PrcInfo_changes	-	90	QAI
prc.PrcInfo	-	90	QAI
prc.OptInfo_changes	-	60	QAI
prc.OptInfo	-	60	QAI
prc.IdxSec_changes	-	69.99	QAI
prc.IdxSec	-	65.02	QAI

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Analyzing and understanding data flows



7.0 Lineage

Scenario

- Currently no reliable or up-to-date data flow documentation exists

Global IDs

- ★ Automatically generated data flow and data lineage diagrams
- ★ Minimal directional user curation
- ★ Visual representation of data flow with ability to highlight specific domains
- ★ Further ability to analyze code (stored procs), ETL configurations, etc.

TRACEABILITY

Example – Data Lineage



7.0 Lineage



8.0 Tracing

The screenshot displays the Global IDs Dashboard interface. On the left is a dark sidebar with navigation options: Dashboard, Survey, Hypothesis, System Recommended, ETL, Stored Procedure, and Manual. The main area is titled 'Dashboard' and shows a breadcrumb trail: Traceability / Dashboard / OCIO Security. A search bar and a 'Hypothesis' dropdown are at the top right. Below the search bar, there are filters for 'Semantic Objects' (OCIO Security) and 'Semantic Domains' (CUSIP). The central part of the dashboard features a data lineage diagram with three columns of nodes. The first column, 'Funds Management', includes nodes like FMGDB02, FundClientMgmt, fmgop_dba_db, fmgop_dw_db, fmgmgr_fm_db, FMGDB05, LGDF, dbo.LGDF_fundinfo, dbo.LGDF_fundinfo_sta..., AutomatedPortfolios_M..., FactSheets, fmgop_fidu_db, fmgop_FIPS_userdata_db, FIPS_db_MenuMapping, FinancialPlanning, FIPS_db, and InvestmentMonitor. The second column, 'Data Warehouse', includes DMSSQL022016, QAI, Data..., INTL_AXIOM, AxiomTranslate, Axiom, AxiomLoad, MUNI_BOND, Equity, AxiomOverride, AxiomLoadMap, LAANDWDB01, WilshireSecurityMaster, PensionPlan, WilshireIndexes, WilshireSecurityPerform..., DataQuality, MSCI, and Indexes. The third column, 'OCIO Security', includes OCIO Security and CUSIP. Blue arrows indicate the flow of data from the Funds Management column to the Data Warehouse column, and then to the OCIO Security column. A blue box highlights the 'OCIO Security' and 'CUSIP' nodes in the third column. A callout box on the right shows a 'Hypothesis' dropdown menu with options: Auto Generated (checked), Code, Manual, and ETL. At the bottom center, a blue banner contains the word 'TRACEABILITY' in white capital letters.

Traceability

We were able to connect applications with directional data flow information for specific semantic domains

- Data flow surveys within the context of an Application
- System data flow prediction based on the available metadata and user inputs
- Data traceability dashboards

Which business questions can we answer now?

- How does my data flow through the applications?
- Where does my data flow originate? Terminate?
- How is data relevant to a business term X routed through applications, databases?

Analyzing and ensuring data quality



9.0 Quality

Scenario

- Currently achieving data quality is a manual task
- Data quality process is not universal between groups and applications
- Operational data quality processes are in the hands of developers

Global IDs

- ★ Comprehensive toolset allowing data quality monitoring:
 - Domain rules
 - SQL rules
 - Semantic Object Rules
- ★ Issue management engine
 - Create and assign issues directly from the data problems detected

TRUST

Example – Domain Rules



9.0 Quality

Domain Rules
Trust / Domain Rules / Portfolio ID / Domain Rule Generat...

← SUMMARY

Domain Name: **Portfolio ID**

Distinct Patterns: 5 | Distinct Tokens: 6 | Documented Datatype: VARCHAR | Classification: Measurement
Distinct Formats: 0 | Distinct Values: 16.5K | Inferred Datatype: Numeric

DATA TYPE

Portfolio ID

Data Type	Occurrence	Feedback
NUMBER	22076 (99.49%)	<input checked="" type="checkbox"/> <input type="checkbox"/> <input style="background-color: #007bff; color: white; border: none; padding: 2px 5px; border-radius: 3px;" type="button" value="?"/>
TEXT	114 (0.51%)	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input style="background-color: #007bff; color: white; border: none; padding: 2px 5px; border-radius: 3px;" type="button" value="?"/>
DATE	0 (0%)	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input style="background-color: #007bff; color: white; border: none; padding: 2px 5px; border-radius: 3px;" type="button" value="?"/>

● NUMBER ● TEXT ● DATE

FORMAT (LENGTH + PATTERN)

WORD ANALYSIS

COMPLETENESS ANALYSIS

ENCODING PARAMETERS

CHARACTER DISTRIBUTION

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TRUST

Example – Domain Rules - Analysis



9.0 Quality

Global IDs

- SQL Rules
- Domain Rules
- Object Rules
- Issue Management

Domain Rules

Trust / Domain Rules / Portfolio ID / Domain Rule Gener

- CHARACTER DISTRIBUTION
- RANGE ANALYSIS
- STANDARD DEVIATION ANALYSIS
- PREDICTED NOISE VALUES
- REFERENCE DATA
- DOMAIN RULESET

Rule Identifier Deta

Domain Rule

Text data type is not allowed for Portfolio ID [GID-08bbe92ccced]

Table Columns File Columns

Portfolio	tbIUBS_IndexMap
Portfolio Name	tbICEMBL_map
PORTFOLIO	tbIMT_OTCOptions
PORTFOLIO	tbIMT_Swaps
PORTFOLIO	tbIMT_Swaptions
PORTFOLIO	tbIMT_Currency
PORTFOLIO	tbIMT_TRRSwap
PortfolioName	tbILookUp.JPMorganBenchmarkShortName
Portfolio	CheckDataIndex

Portfolio Name

Error Values Error Records

Value	Error Count	Issue ID
<input type="checkbox"/> SCEMBD	1	
<input type="checkbox"/> SCEMBDA	1	
<input type="checkbox"/> SCEMBDAC	1	
<input type="checkbox"/> SCEMBDAD	1	
<input type="checkbox"/> SCEMBDAI	1	
<input type="checkbox"/> SCEMBDAK	1	
<input type="checkbox"/> SCEMBDAM	1	

Data Warehouse	22
Data Warehouse	201
Data Warehouse	2
Data Warehouse	2
Data Warehouse	2
Data Warehouse	12
Data Warehouse	2
Data Warehouse	219
Client Status Database and Web Server	1

GID-08bbe92ccced	Text data type is not allowed for Portfolio ID	Data Type	142659
GID-b9b783646e04	Date data type is not allowed for Portfolio ID	Data Type	142659

TRUST

Example – SQL Rules



9.0 Quality

Global IDs

Trust / SQL Rules / Rule

Portfolio Characteristic Consistency (Published)

Applied on: Database Server/SSIS packages@FMGDEV01.fromDavidZee

Consistency (DQ Dimension): 31 (0.11%)
Matched Records Changed: 31 (2022-01-28 13:23)
Checked Records: 29.4K
New Records: NA
Snoozed Records: NA
False Positive Records: NA
Succeeded

Identifier consistency (Rule Group)

Critical (Priority)

Runs in every (Paused)

```
1 select  
2 "Lipper_FundInfo"."port_no"  
3 from  
4 "Lipper_FundInfo"  
5 where  
6 "Lipper_FundInfo"."port_manager" IS
```

Execution History | **Dependent Rules** | **Matched Records**

Snapshot At: 2022-01-28 | 13:23:00
Snooze | False Positive | Snoozed Records | False Positive Records

Global IDs Rules Trust / SQL Rules

Portfolio Characteristic Consistency (Published) | Consistency | Critical

31 (0.11%) | 2 hours ago | Succeeded | Next scheduled on: NA | Runs in every: NA

Anatoli Arkhipenko Created: 2 hours ago | Updated: 2 hours ago

TRUST

Example – Data Quality Dashboards



The screenshot displays the "Global IDs" interface. On the left is a dark blue sidebar with the "Global IDs" logo and a "Dashboards" menu. The main area shows a "Domain Data Quality Dashboard" with a search bar and filter tabs for "All", "Transparency", and "Traceability". A preview window shows a smaller version of the dashboard. The dashboard itself has a top navigation bar with a search bar and a "Last updated on 2022-02-01 10:46" timestamp. Below this are three summary cards: "#DOMAIN(S)" with a value of 1, "#POLICIES" with a value of 1, and "#ERROR(S)" with a value of 285.3K. The main content area includes a "Domains" filter panel on the left, a bar chart titled "Error By Databases and Domains" showing error counts for various systems, a donut chart titled "#Error by Rule Type" showing error distribution by rule type, and a "Domain Error Details" table listing specific errors.

Domain Name	Rule Detail	Rule Type	Schema Name	Table Name
Portfolio ID	Text data type is not allowed for ...	Data Type	axiomsq1	data_load_summary
Portfolio ID	Date data type is not allowed for ...	Data Type	fmgop_FIPS_userdata_db	JHLPLMasterMapping
Portfolio ID	Date data type is not allowed for ...	Data Type	axiomsq1	data_load_summary
Portfolio ID	Text data type is not allowed for ...	Data Type	fmgop_FIPS_userdata_db	JHLPLMasterMapping
Portfolio ID	Text data type is not allowed for ...	Data Type	InvestmentMonitor	FundFamilyFundTha
Portfolio ID	Date data type is not allowed for ...	Data Type	InvestmentMonitor	FundFamilyFundTha

TRUST

Trust

We were able define specific validation rules for each semantic domain

- Various ways to validate data and metadata based on the real dataset
- Centrally monitor and react to data quality issues
- Spawn data issue resolution workflows

Which business questions can we answer now?

- Can I trust my data?
- Is data coming from vendors accurate and complete?
- Where do I have data quality issues?
- Who is working on a data quality issue X?