ADVANCEMENTS IN GOVERNANCE ARCHITECTURE
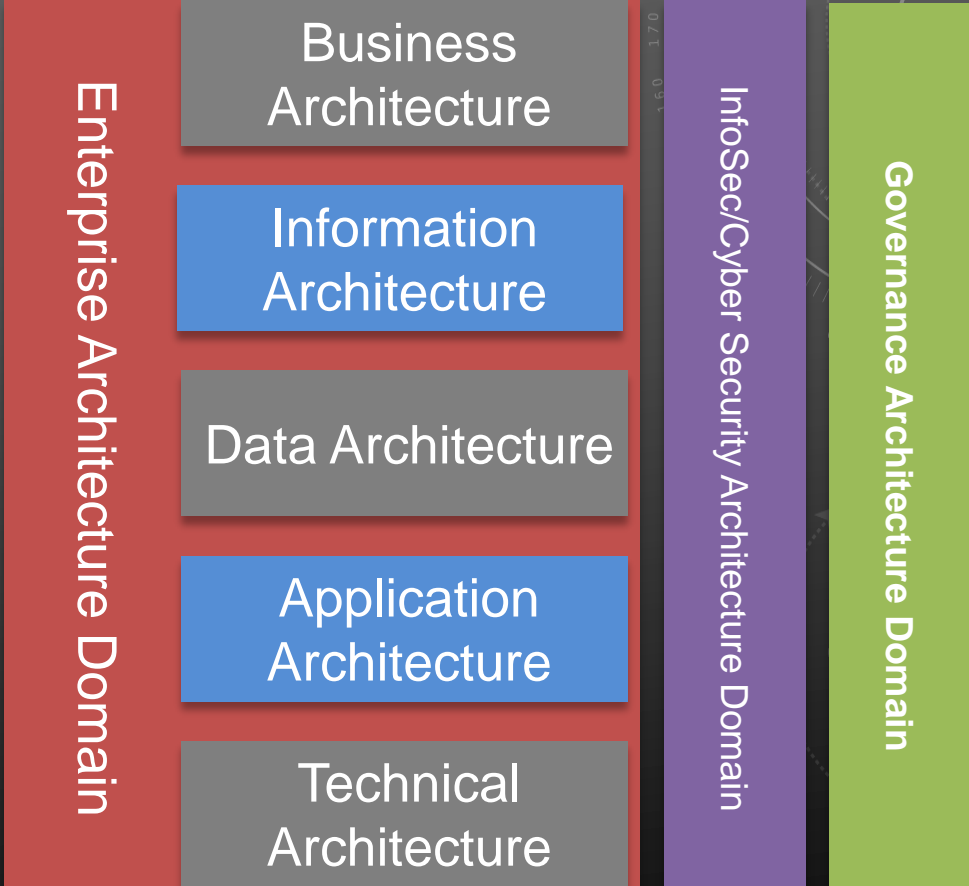
STEVEN ZAGOUDIS

METAGOVERANCE

Data Governance Architecture

Business Process Integration

Data Enhancement

Reconciliation Control Framework

Liaison to Corporate Governance

Charter, Policy and Procedures

Governance Metadata

System of Record/ Known Copies

Business Glossary

Security/ Record Retention

Stakeholders
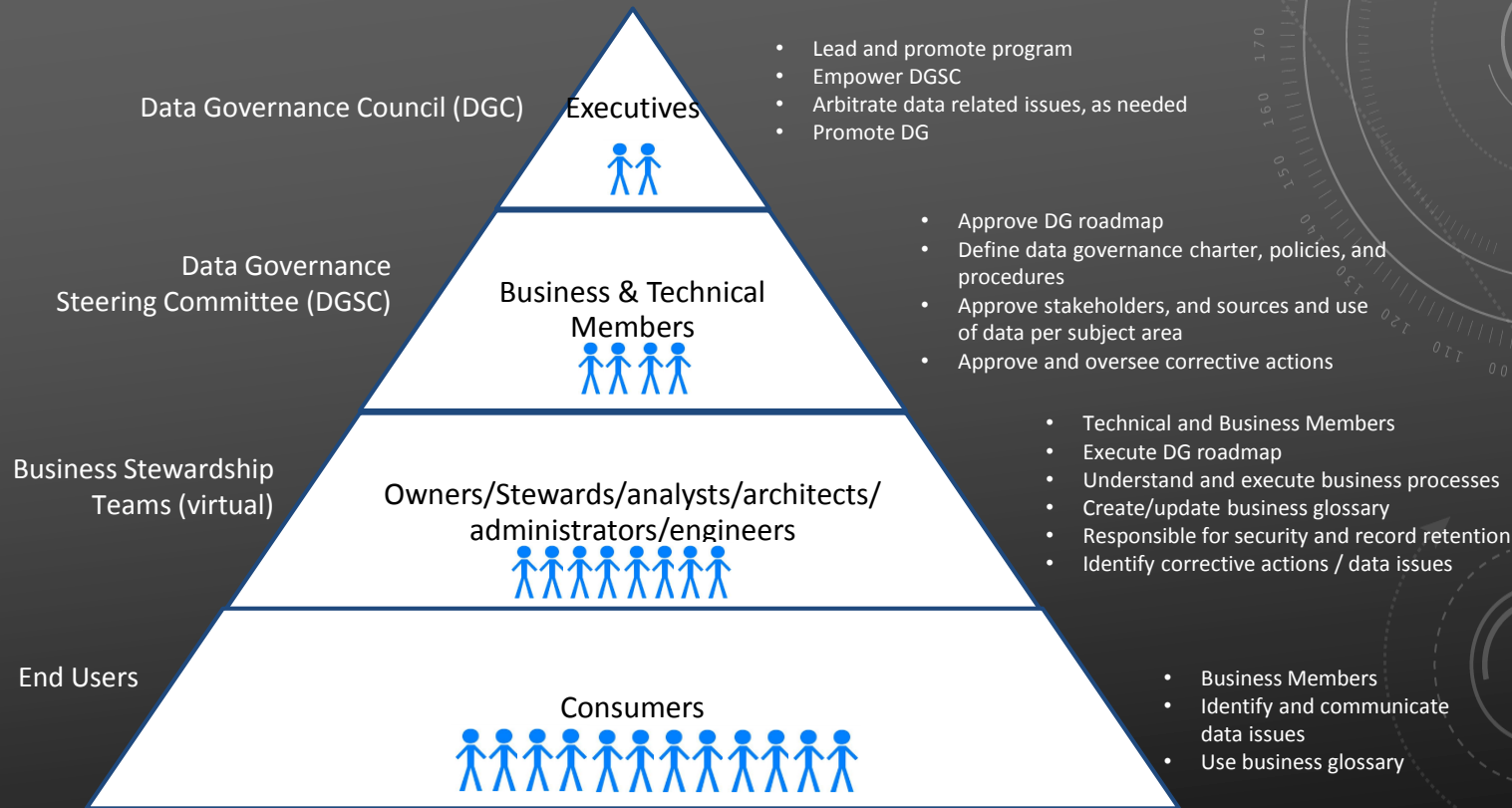
Data Owner/Steward

Data Consumers
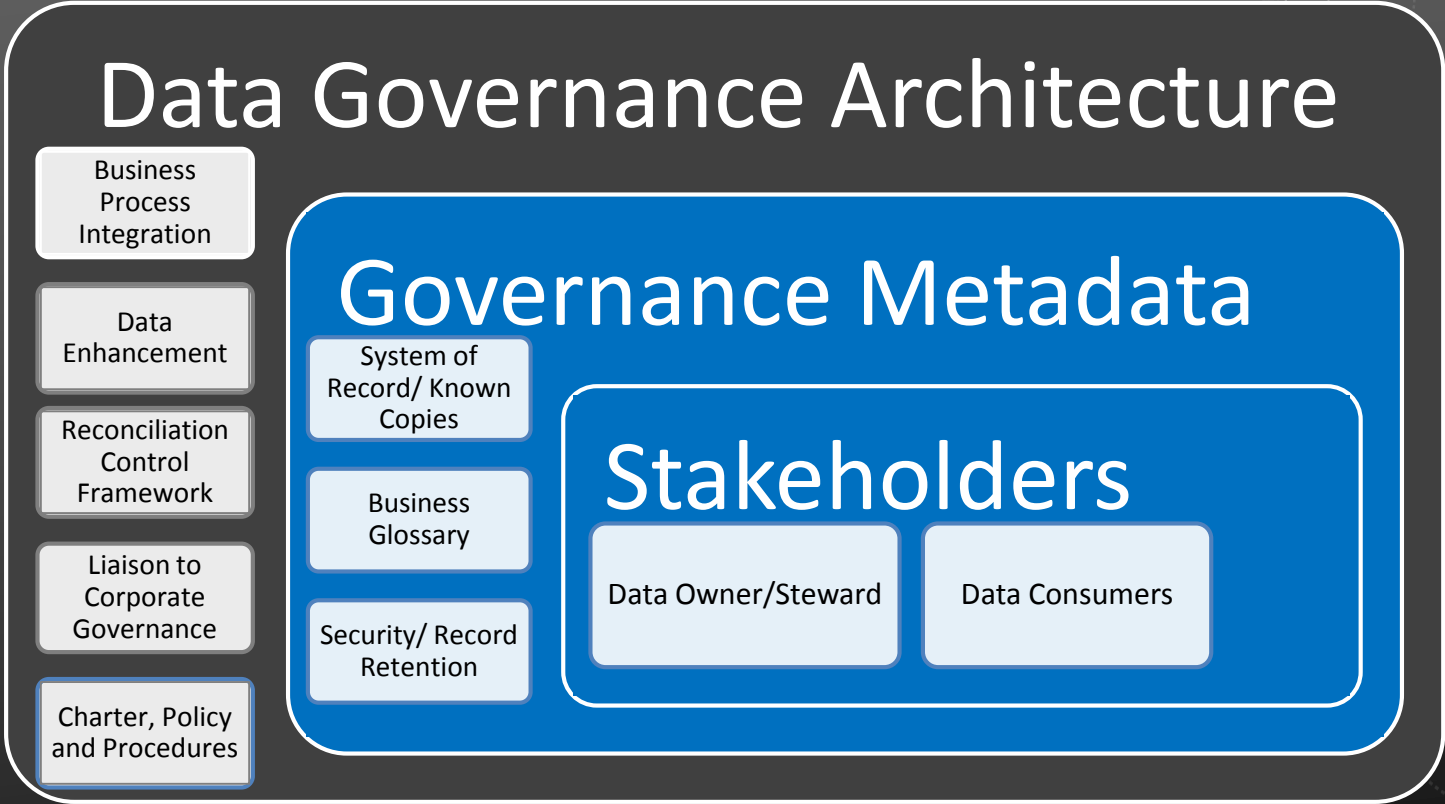
COMPONENTS OF A DATA GOVERNANCE ARCHITECTURE

- Data Governance Architecture crosses all layers of Enterprise Architecture

- Data Governance Architecture includes aspects of the Information Security or Cyber Security Architecture

- Each of these components drive the identification of Registered Governance Stakeholders

Enterprise Architecture Domain

- Business Architecture
- Information Architecture
- Data Architecture
- Application Architecture
- Technical Architecture

InfoSec/Cyber Security Architecture Domain

Governance Architecture Domain

DATA GOVERNANCE ARCHITECTURE STAKEHOLDERS

Data Governance Council (DGC) — **Executives**

- Lead and promote program
- Empower DGSC
- Arbitrate data related issues, as needed
- Promote DG

Data Governance Steering Committee (DGSC) — **Business & Technical Members**

- Approve DG roadmap
- Define data governance charter, policies, and procedures
- Approve stakeholders, and sources and use of data per subject area
- Approve and oversee corrective actions

Business Stewardship Teams (virtual) — **Owners/Stewards/analysts/architects/administrators/engineers**

- Technical and Business Members
- Execute DG roadmap
- Understand and execute business processes
- Create/update business glossary
- Responsible for security and record retention
- Identify corrective actions / data issues

End Users — **Consumers**

- Business Members
- Identify and communicate data issues
- Use business glossary

A PRIMARY FUNCTION OF DATA GOVERNANCE ARCHITECTURE IS TO PROVIDE A FRAMEWORK FOR CONTINUAL AWARENESS OF THE SOURCE AND USE OF DATA AND INFORMATION
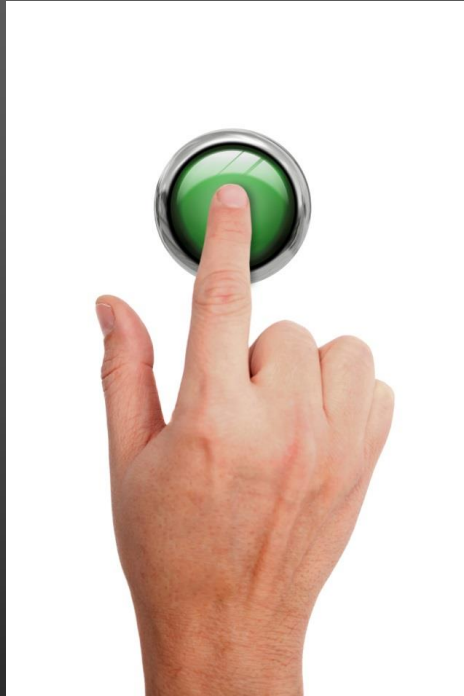
EFFECTIVE DATA GOVERNANCE ARCHITECTURE LEADS TO **INCREASES** IN OPERATIONAL EFFICIENCY…

- Automation of Manual Data Validation

- Elimination of Redundant Reporting Efforts

- Reduced Remediation Costs

- Automated Software Testing

...AND REDUCTION IN OVERALL ENTERPRISE RISK

RISK MANAGEMENT

- Business Decisions Based on Good Data

- Data Loss Prevention (Cyber Security)

- Financial Statement Accuracy

- Clean Audit Reports

- Improved Regulatory Rating

- Reduced Reputation Risk

DATA GOVERNANCE ARCHITECTURE – BUSINESS BENEFIT

- Provides ongoing awareness of 'who uses what data, from where'
- Targeted notification of proposed data content/structure changes
- Targeted notification of Data Governance Controls
- Enables field-level Data Ownership and Accountability
- Facilitates Data Governance Committee/Working Groups
- Foundation for a Data Governance Communication Plan

DATA GOVERNANCE ARCHITECTURE – TECHNOLOGY BENEFIT

- Metadata map of the entire information and data architecture
- Tracking known copies of data
- Clarity of Data Owners for Change Control
- Awareness of Data Consumers (who needs informed)
- Clear system-to-data relationship
- Clear Record Retention and Security Classification Requirements

REGISTERED GOVERNANCE STAKEHOLDER IS FRONT AND CENTER IN ALL ASPECTS OF DATA GOVERNANCE COMMUNICATION AND COORDINATION
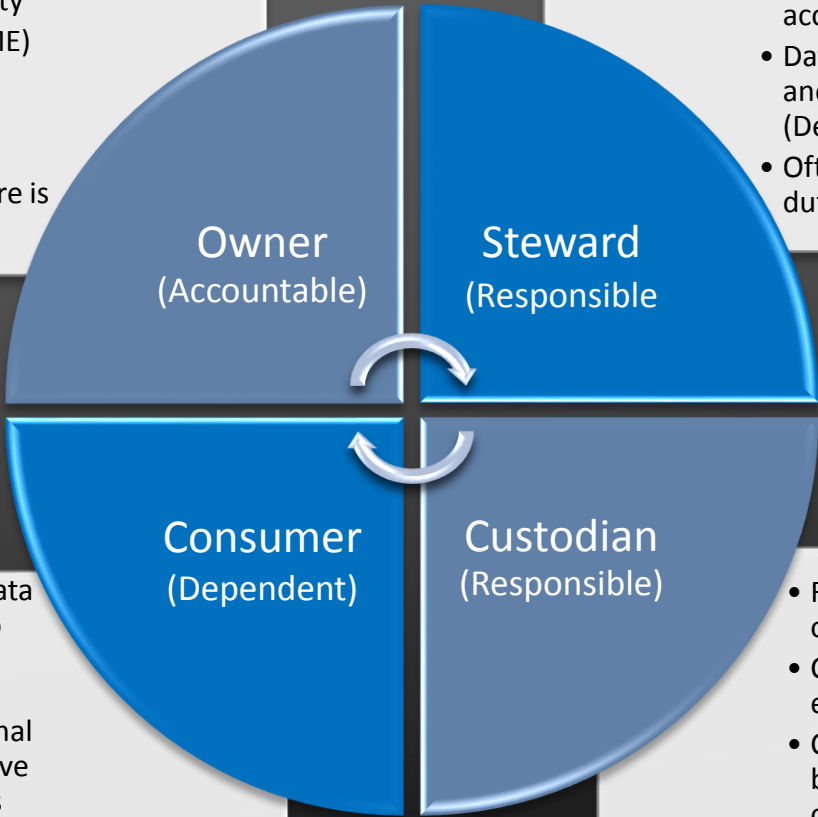
REGISTERED GOVERNANCE STAKEHOLDER

A Registered Governance Stakeholder is a business or technology unit that has a vested interest in the information or data assets *at a particular point in time*.

"Registration" occurs as part of the Data Governance implementation.

REGISTERED GOVERNANCE STAKEHOLDER STEWARDSHIP MODEL

Owner (Accountable)
- Accountable for Data Quality
- Subject Matter Experts (SME)
- Follows process workflow
- Data Owners are normally tasked with data entry/collection unless there is an overriding reason

Steward (Responsible
- Responsible but not solely accountable
- Data maintenance on behalf of another Business Unit (Delegates)
- Often driven by separation of duties issues

Consumer (Dependent)
- Vested stakeholders of data
- "Missing puzzle piece" to most Data Governance efforts
- Business Units and external entities that use or receive data are Data Consumers
- Registered consumers of data

Custodian (Responsible)
- Responsible for safeguard of physical data assets
- Custodians are IT or external vendor
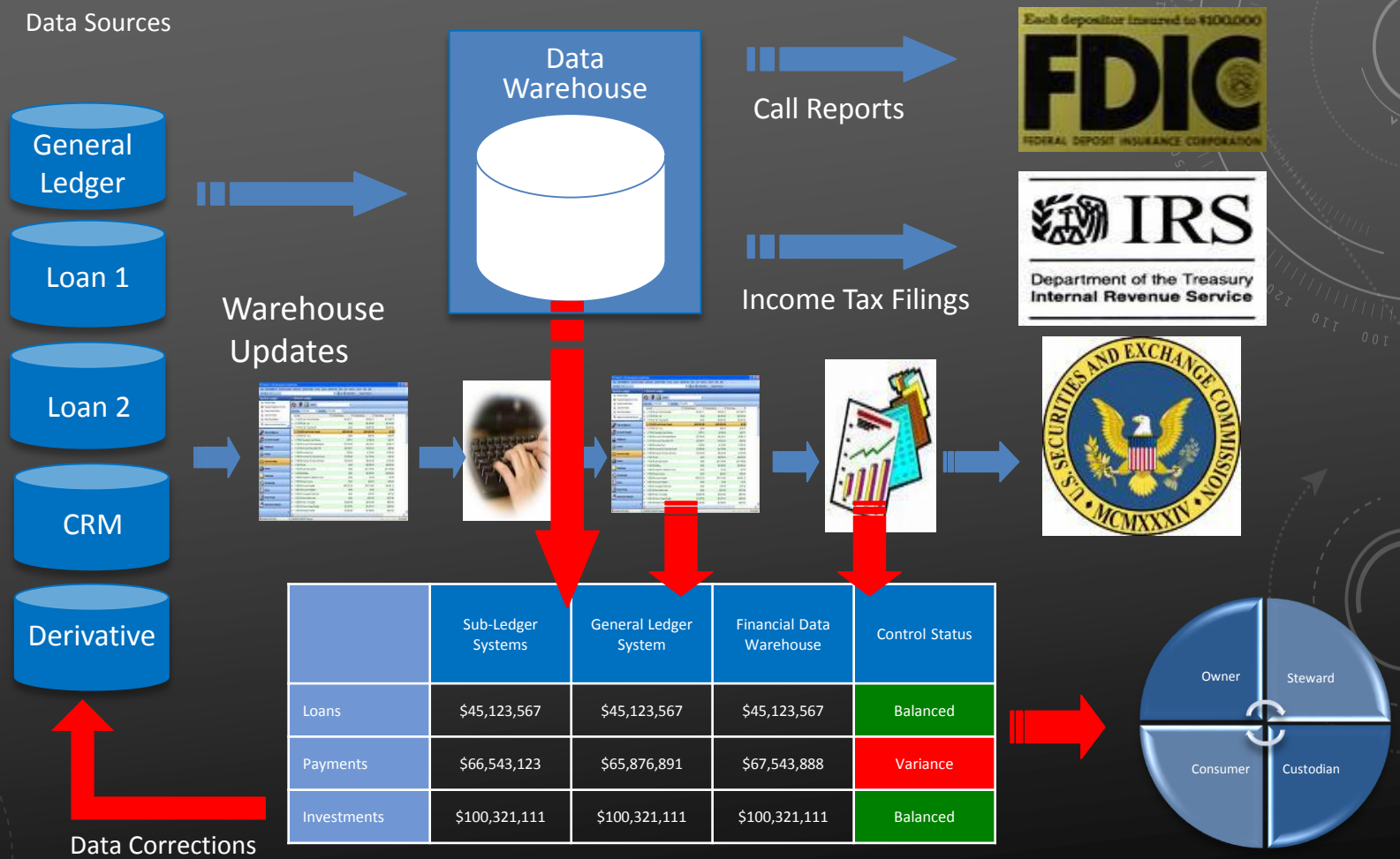- Custodian may be a business unit in the case of End-User Computing

THE GOVERNANCE AWARENESS MATRIX

Data Subject Area ID	Major Subject Group	1st Sub Grouping	2nd Sub Grouping	Accounting Operations	Collateral	Credit Risk	Market Risk	Member Services	Sales	Compliance	Information Technology
1	Trade	Loan	Adjustable-Rate Loan	CONSUMER	CONSUMER	CONSUMER	CONSUMER	CONSUMER	OWNER	STEWARD	CUSTODIAN
5	Trade	Loan	Letters of Credit	CONSUMER	CONSUMER	CONSUMER		CONSUMER	OWNER		CUSTODIAN
6	Trade	Loan	Prepayment Fee	CUSTODIAN		CONSUMER		OWNER	OWNER		
11	Financial	Accounting	Accrued Interest	CUSTODIAN		CONSUMER		CONSUMER	CONSUMER		
12	Financial	Accounting	Outstanding Principle	OWNER	CONSUMER	CONSUMER		CONSUMER	CONSUMER	STEWARD	CUSTODIAN

LEGEND

CONSUMER	(blue)
OWNER	(yellow)
STEWARD	(red)
CUSTODIAN	(dark gray)

THE AWARENESS MATRIX ENABLES THE CONTROL FRAMEWORK TO TARGET SPECIFIC STAKEHOLDER NOTIFICATION

Data Sources

General Ledger

Loan 1

Warehouse Updates

Loan 2

CRM

Derivative

Data Corrections

Data Warehouse

Call Reports

Income Tax Filings

FDIC — Each depositor insured to $100,000 — FEDERAL DEPOSIT INSURANCE CORPORATION

IRS — Department of the Treasury Internal Revenue Service

U.S. SECURITIES AND EXCHANGE COMMISSION · MCMXXXIV ·

	Sub-Ledger Systems	General Ledger System	Financial Data Warehouse	Control Status
Loans	$45,123,567	$45,123,567	$45,123,567	Balanced
Payments	$66,543,123	$65,876,891	$67,543,888	Variance
Investments	$100,321,111	$100,321,111	$100,321,111	Balanced

Owner | Steward

Consumer | Custodian

RELATIONSHIP OF DATA + GOVERNANCE ROLE + SOURCE SYSTEM = REGISTERED GOVERNANCE STAKEHOLDER

Data Sources

Source System

Business Data Elements

Data Assets

Subject Areas

Governance Roles

Governance Relationship

Organizational Units who have a vested interest in the data

Registered Governance Stakeholder
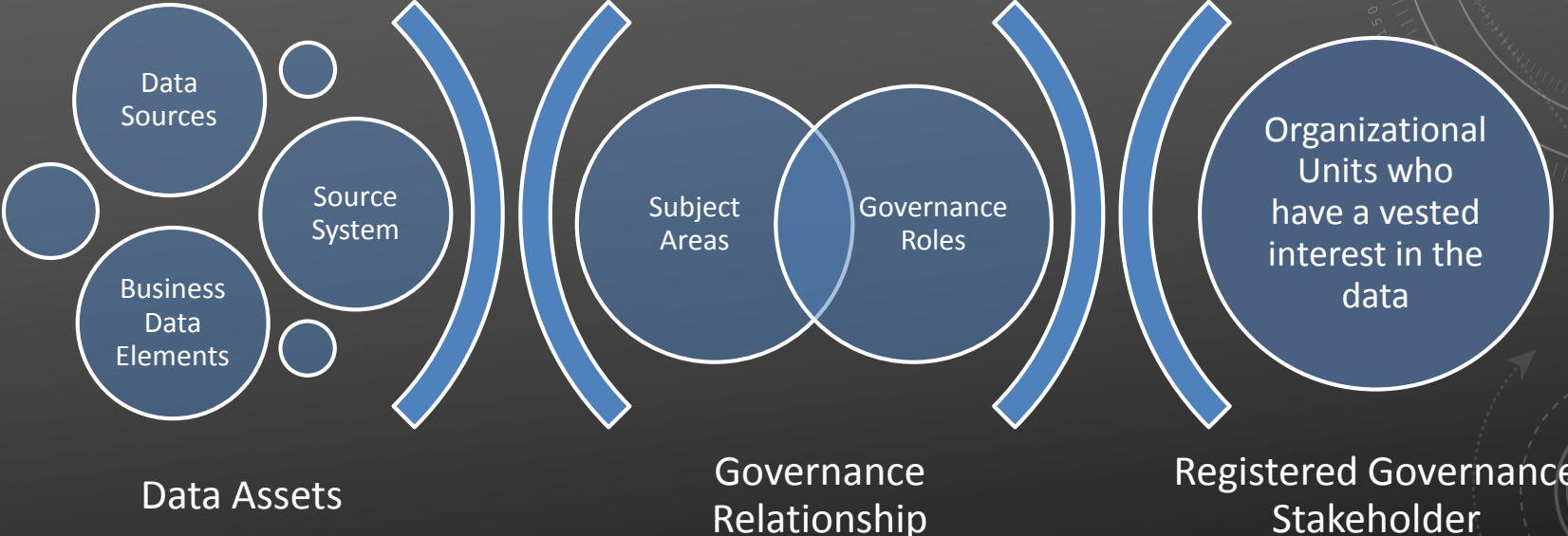
HITTING THE BULLSEYE ON DATA GOVERNANCE IS PRICELESS

- Who uses my data?

- Who can fix the problem?

- What are the load results?

- Is the data accurate?

- Did the data change?

- How do I keep my department in the loop?

THE DATA UNIVERSE OF AN ORGANIZATION IS DEFINED AS METADATA WITHIN THE GOVERNANCE ARCHITECTURE

DATA GOVERNANCE METADATA ARCHITECT OVERSIGHT ROLE

- A *critical role is emerging* tasked to create metadata linages between all aspects of the enterprise

- Metadata is the *glue that binds* business to its data and information

- The Governance Metadata Architect may be an external resource skilled in Governance, Enterprise Architecture, and Metadata Architecture

- This role should ultimately be on staff to ensure technology-enabled sustainable governance
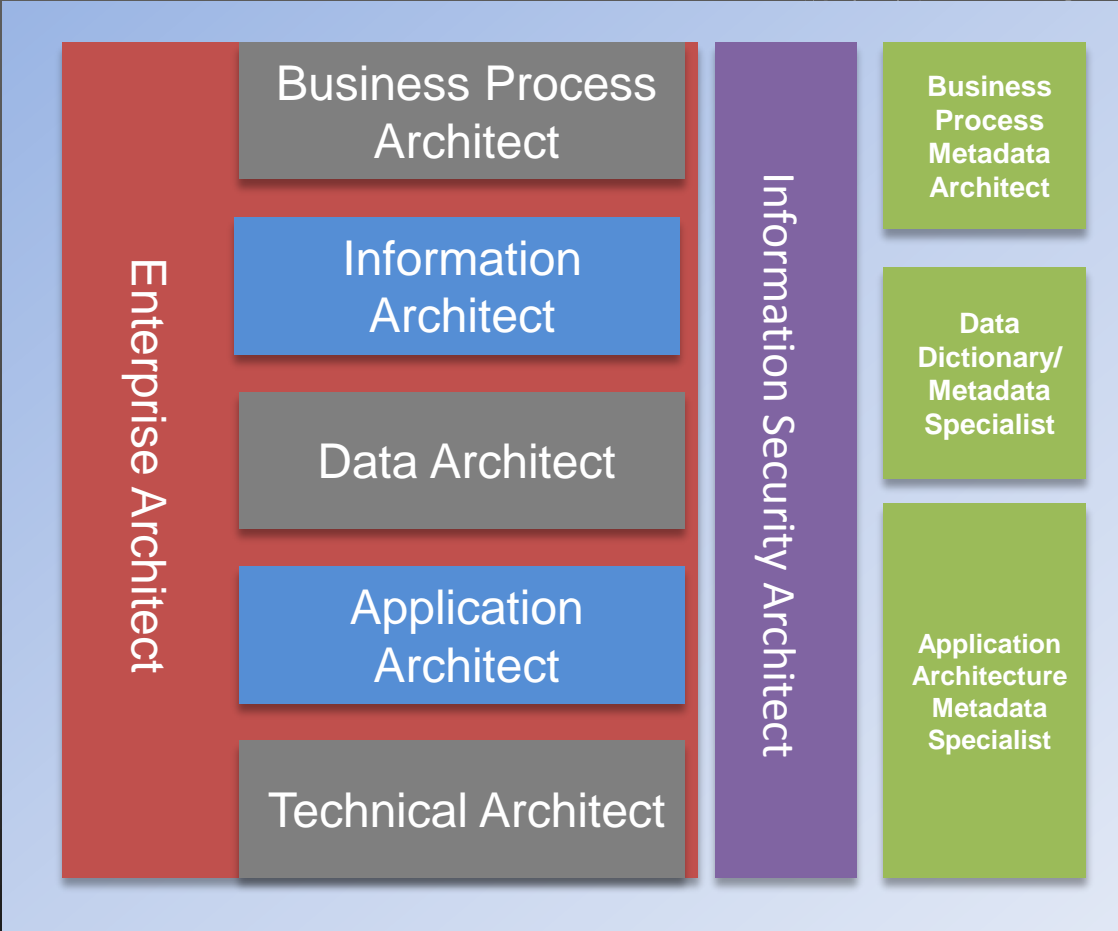
Unfortunately, metadata content, and its definition, is seriously siloed across the business and technical landscape due to disparate systems and lack of metadata architecture.

A metadata tool that does not support these linkages will result in breaks in the awareness between data and the business. Metadata "stovepipes" require technology to link the different databases, or the creation of a metadata data warehouse to overcome the tool limitations.

THE DATA GOVERNANCE METADATA SPECIALIST

Owner | Steward
Consumer | Custodian

Metadata Owner | Metadata Steward
Metadata Consumer | Metadata Custodian
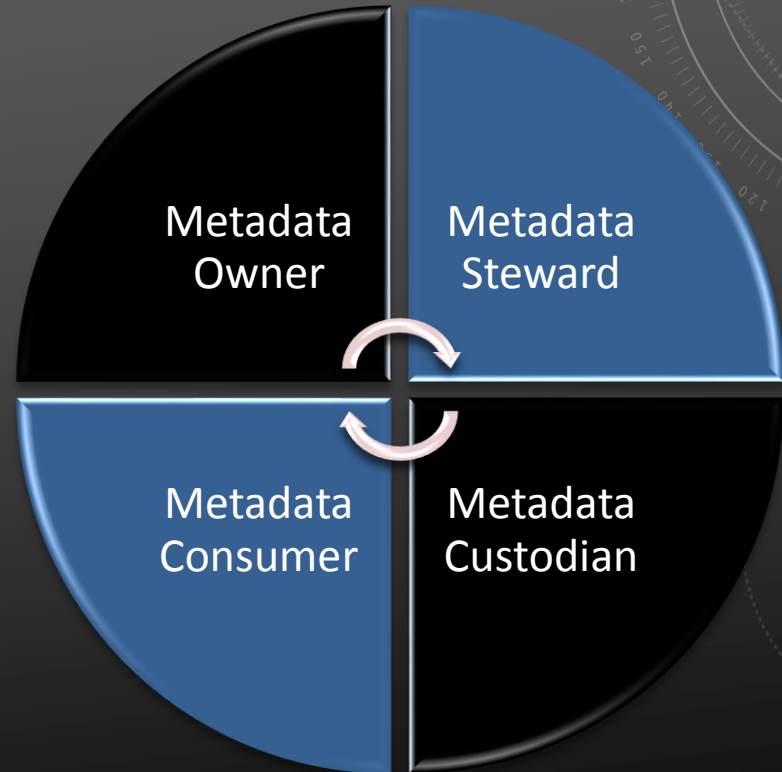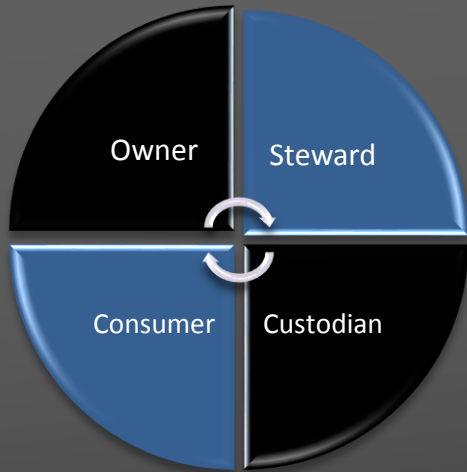
There is a corresponding stewardship role for Data Governance Metadata
      "Lessons from the trenches"

METADATA GOVERNANCE WORKING GROUP

CHARTER

The Metadata Governance working group serves as the principal forum for the implementation of metadata standards and governance across the organization. The working group shall also act as the primary communication channel for metadata-related standards, controls, issues or changes that can have an impact on the definitions, use, quality, or availability of the organization's processes, controls, systems, information, or data assets.

THE METADATA GOVERNANCE POLICY

A Metadata Governance policy defines the objectives and guidelines that are the foundation of Metadata Governance of the organization:

- Scope – Applies to the definition, usage, retention, and controls of the organization's metadata assets.

- Authority – Data Governance Executive Steering Group.

- Review Frequency – Annual.

- Objective – Establish appropriate use of corporate metadata to protect against inconsistencies in definition, standards, misinterpretation, or unnecessary restrictions on metadata access that could lead to process inefficiencies, information or data anomalies, ineffective controls or increased costs to the application and technical architectures of the organization.

METADATA GOVERNANCE GUIDING PRINCIPLES

- Metadata will be coordinated across all layers of the Enterprise Architecture.

- The policy will be defined and implemented at the level of subject areas of metadata (e.g. Business Architecture/Process/Process Control/Control Parameters).

- The Metadata Governance Working Group will define the official system of record for each metadata subject area.

- Metadata subject areas will have clearly-define data owners and data stewards (as needed).

- The organization will maintain awareness of the departmental consumption of metadata.

- Metadata data owners will maintain responsibility for the metadata domain values. Domain values will be reviewed and approved by metadata consumers.

- Definitions (dictionaries) will be maintained for metadata subject areas.

- Security classifications will be factored into the policies/procedures on metadata management of the reports developed with organizational data may be subject to risk classification and controls.

LOOKING AT THE UNDERLYING METADATA RELATIONSHIPS...

SUBJECT AREAS ARE THE FOUNDATION OF GOVERNANCE ARCHITECTURE

Subject Area
Subject Area ID (PK) Subject Area Name Subject Area Description Subject Area Major Subject Area Subgroup 1 Subject Area Subgroup 2 Subject Area Long Description

Examples
Subject Area ID : 1
Subject Area Name : Info Arch/Entity/Classification
Subject Area Description : Classification standards for entities
Subject Area Major : Information Architecture
Subject Area Subgroup 1 : Entity
Subject Area Subgroup 2 : Classification
Subject Area Long Description : Extended explanation…

Architecture Layer	Required Metadata Linkage	Description
Governance Architecture	Subject Area-to-Governance Role	The ability to associate Subjects Areas to the role of owner, steward, consumer, or custodian for a business unit, including designation of system (InfoSource) used by the department for obtaining the data.
Business Architecture	Subject Area-to-Business Process	The ability to associate Subjects Areas to Business Process (detailed or high-level). This association enables awareness of the Business Processes, the Subject Areas, the Governance Roles, and ultimately the applications and data.
Information Architecture	Subject Area-to-System-of-Record and known copies	The ability to indicate the official system of record and all registered copies for a Subject Area.
Information Architecture	Subject Area-to-Business Attribute	The ability to associate Business Attributes (data elements) with one or more Subject Areas; The ability to provide a detailed definition (glossary) at the business level that provides the business meaning of the attribute regardless of where it is physically stored; the ability to record synonyms, homonyms and antonyms within Business Attributes.
Information Architecture	Subject Area-to-Control Attribute	The ability to associate Business Attributes that are designated as controls, critical data elements, or key performance indicators.
Information Architecture	Subject Area-to-Security Classification and Record Retention	The ability to associate the security classification and record retention for the content within a Subject Area.

Architecture Layer	Required Metadata Linkage	Description
Data Architecture	Business Attribute-to-Data Object	The ability to associate one or more physical data elements (Data Object) with a Business Attribute. As example, Accrued Interest is stored in across many transactional systems and the General Ledger under different table.column combinations, or account ranges; the ability to record synonyms, homonyms and antonyms the Data Objects; the ability to provide detailed format information; the ability to provide additional definitions about a specific occurrence of data that is distinguished from the Business Attribute definition.
Data Architecture	Data Object-to-Data Source	The ability to associate a Data Object with the fully qualified database or spreadsheet name. (e.g. FactSecurity.AccruedInterest is within the EDWDB Data Source (EDWDB.FactSecurity.AccruedInterest)).
Data Architecture	Control Attribute-to-Control Object	The ability to associate a Control Attribute (e.g. Accrued Interest) with the physical data element (Data Object) (e.g. FactSecurity.AccuredInterest)
Application Architecture	InfoSource-to-Data Source	The ability to associate a system (InfoSource) to a physical database or file structure. As example, Trades (InfoSource) resides on Oracle DB (Data Source). This association enables visibility between systems and the underlying data, that when used in conjunction with the governance metadata, connects the business to the data sources.
Application Architecture	Data Object-to-Report	The ability to record the specific Data Objects associated with any given report, along with detailed calculations.
Application Architecture	Data Lineage	The ability to record the chaining of data movement across the data architecture (e.g. Informatica ETL workflow)

ID	SUBJECT AREA	DESCRIPTION
001	TRADE / LOAN / INITIAL ISSUANCE	Details related to the initial issuance of a consumer loan.
002	TRADE / LOAN / TRADE BALANCES	Contains updated consumer loan balance details.
010	TRADE / LOAN / LOAN ACCOUNTING	Contains loan balances, including interest due on current and

Subject Area: (002) TRADE / LOAN / TRADE BALANCES

Details
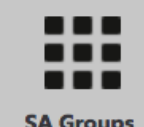
Categories

Governance (5)

Info Sources

Business Attributes

Security Classes

Retention Classes

SA Type Groups

ORG. GROUP	ROLE TYPE	EFFECTIVE FROM
Accounting (ACCOUNTING)	Owner	Apr 1, 2016
Compliance (COMPLIANCE)	Consumer	Apr 1, 2016
Consumer Lending (CONSUMER LENDING)	Consumer	Apr 1, 2016
Credit Risk (CREDIT RISK)	Consumer	Aug 1, 2016
Enterprise Risk & Modeling (ENTERPRISE RISK & MODE...)	Consumer	Aug 1, 2016

Org. Groups

Info Sources

Categories

Subject Areas

SA Groups
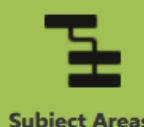
Governance

BUSINESS ATTRIBUTES

MNEMONIC | GROUP | DESCRIPTION | EFFECTIVE

Org. Groups

Info Sources

Categories

Subject Areas

SA Groups

Governance

Business Attr.

Organizational Group: ACCOUNTING - Accounting

Details

Governance

People

ROLE TYPE	SUBJECT AREA	EFFECTIVE FROM	EFFECTIVE THRU
Consumer	(011) TRADE / LOAN / LOAN DELINQUENCY	Apr 1, 2016	
Owner	(013) TRADE / MORTGAGE / TRADE BALANCES	Apr 1, 2016	
Owner	(010) TRADE / LOAN / LOAN ACCOUNTING	Apr 1, 2016	
Owner	(002) TRADE / LOAN / TRADE BALANCES	Apr 1, 2016	
Steward	(014) TRADE / MORTGAGE / INITIAL ISSUANCE	Apr 1, 2016	

Help

MARKET RISK	Market Risk	Market Risk	Apr 1, 2016
MORTGAGE SERVICI...	Mortgage Servicing	Mortgage Servicing	Apr 1, 2016
OPERATIONAL RISK	Operational Risk	Operational Risk	Apr 1, 2016
PROCESSING AND R...	Processing and Review	Processing and Review	Apr 1, 2016

DATA OBJECT	BUSINESS ATTRIBUTE	DATA SOURCE	RECORD TYPE	EFFECTIVE FRO
demoGL > GL > ACCOUNT BALANCE	ACCRUED INTEREST	demoGL	Known Copy	Apr 1, 2016
ACCTXLS > demo_acctxls > ACCRUED INTEREST	ACCRUED INTEREST	ACCTXLS	Known Copy	Apr 1, 2016
demoEDW > TradeSum > ACCR_INT	ACCRUED INTEREST	demoEDW	Known Copy	Apr 1, 2016
demoTrade > Trade > ACCRINT	ACCRUED INTEREST	demoTrade	System of Record	Apr 1, 2016
ACCTXLS > demo_acctxls > CURRENT PRINCIPLE	BOOK VALUE	ACCTXLS	Known Copy	Apr 1, 2016
demoGL > GL > ACCOUNT BALANCE	BOOK VALUE	demoGL	Known Copy	Apr 1, 2016
demoEDW > TradeSum > CURRENT_BALANCE	BOOK VALUE	demoEDW	Known Copy	Apr 1, 2016
demoTrade > Trade > OUTSTANDINGBALANCE	BOOK VALUE	demoTrade	System of Record	Apr 1, 2016
demoEDW > TradeSum > MEMBER_ID	LEGAL ENTITY ID	demoEDW	System of Record	Apr 1, 2016
demoTrade > Trade > MEMBERRID	LEGAL ENTITY ID	demoTrade	System of Record	Apr 1, 2016
demoEDW > TradeSum > MEMBER_NAME	LEGAL ENTITY NAME	demoEDW	Known Copy	Apr 1, 2016
demoTrade > Trade > MEMBERNAME	LEGAL ENTITY NAME	demoTrade	Known Copy	Apr 1, 2016
demoEDW > TradeSum > LOAN_ID	LOAN ID	demoEDW	Known Copy	Apr 1, 2016
demoTrade > Trade > LOANID	LOAN ID	demoTrade	System of Record	Apr 1, 2016

Ctrl Design

Scheduled Ctrls

Finished Ctrls

Data Sources

Incidents

Data Objects

Governance Roles and Information Sources by Subject Area

Subject Code: 002*   **Subject Area:** ADVANCE/TRADE BALANCES

Official System of Record: LOAN ORIGINATION SYSTEM   **Security Classification:** Sensitive   **Retention:** 7Y 7 years from last business event

Org. Group	Governance Role	Org. Group Information Source	Org. Group System of Record	Effective From	Effective Thru
Accounting	Delegate	LOAN ORIGINATION SYSTEM	Yes	07/13/2017	Still Effective
Accounting	Delegate	UDA100*	Yes	07/13/2017	Still Effective
Compliance	Consumer	LOAN ORIGINATION SYSTEM	Yes	04/01/2016	Still Effective
Consumer Lending	Consumer	LOAN ORIGINATION SYSTEM	Yes	04/01/2016	Still Effective
Correspondent Banking	Delegate	LOAN ORIGINATION SYSTEM	No	07/13/2017	Still Effective
Credit Risk	Owner	LOAN ORIGINATION SYSTEM	No	07/13/2017	Still Effective
Enterprise Risk & Modeling	Consumer	UDA100*	No	07/13/2017	Still Effective
Market Risk	Consumer	UDA100*	No	08/01/2016	Still Effective

Organization Group: Accounting

| Governance Role	Subject Area Code	Subject Area	Information Source	System Of Record
Delegate	002*	ADVANCE / TRADE BALANCES	LOAN ORIGINATION SYSTEM	Yes
Delegate	002*	ADVANCE / TRADE BALANCES	UDA100*	Yes
Owner	010	TRAN / MPF / LOAN ACCOUNTING	INTEREST ADJUSTMENT SPREADSHEET	Yes
Owner	010	TRAN / MPF / LOAN ACCOUNTING	LOAN ORIGINATION SYSTEM	Yes
Consumer	011	TRAN / MPF / LOAN DELINQUENCY	GENERAL LEDGER	No
Owner	013	TRAN / MPF / TRADE BALANCES	LOAN ORIGINATION SYSTEM	Yes

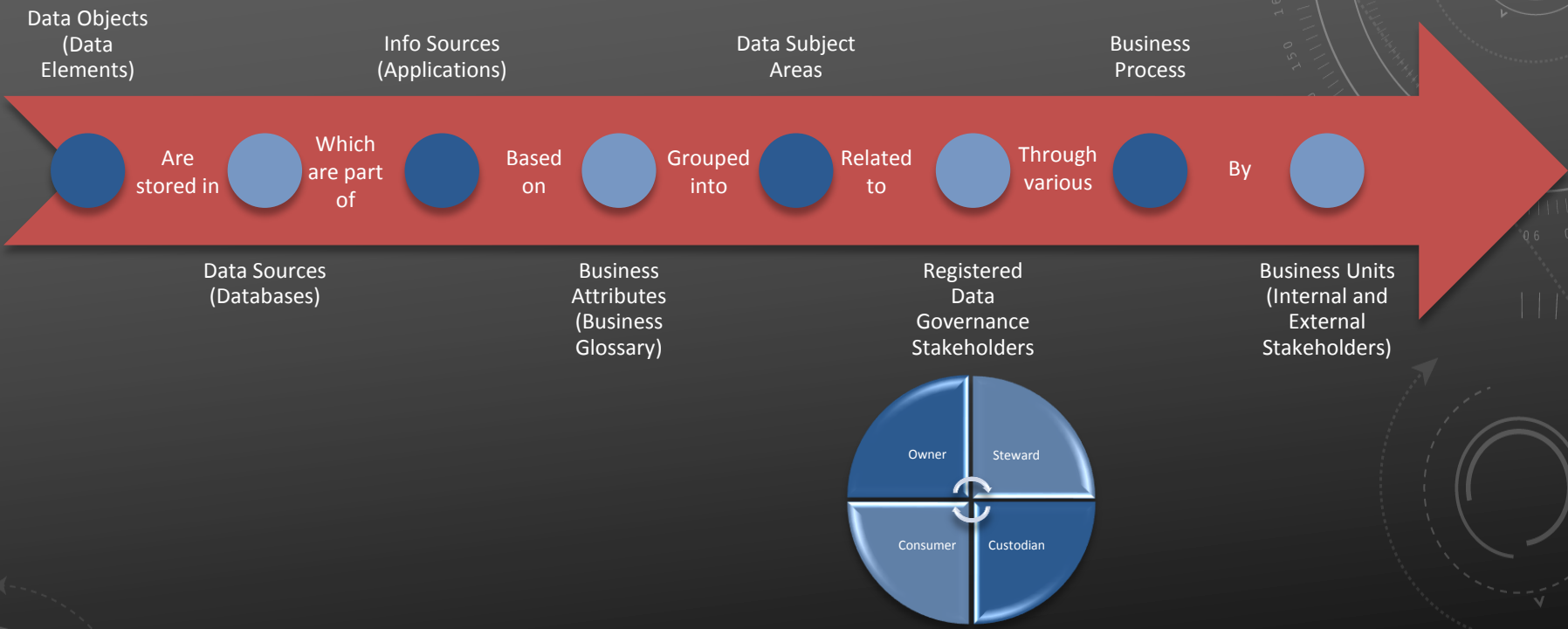| Subject Area (SA) Name	Business Attribute (BA)	BA Description	Data Object (DO)
ADVANCE/TRADE BALANCES	ACCRUED INTEREST	Accrued Interest amount on the Bank's book for a security.	Trade > ACCRINT > demoTrade
ADVANCE/TRADE BALANCES	ACCRUED INTEREST	Accrued Interest amount on the Bank's book for a security.	GL > ACCOUNT BALANCE > demoGL
ADVANCE/TRADE BALANCES	ACCRUED INTEREST	Accrued Interest amount on the Bank's book for a security.	TradeSum > ACCR_INT > demoEDW
ADVANCE/TRADE BALANCES	ACCRUED INTEREST	Accrued Interest amount on the Bank's book for a security.	demo_acctxls > ACCRUED INTEREST > ACCTXLS
ADVANCE/TRADE BALANCES	CURRENT PRINCIPAL	The current principal amount of the loan or mortgage.	
ADVANCE/TRADE BALANCES	ESTIMATED MATURITY DATE	Estimated Maturity Date of the security as forecasted from model.	
ADVANCE/TRADE BALANCES	ADVANCE ID	Primary identifier for a loan or mortgage.	Trade > LOANID > demoTrade
ADVANCE/TRADE BALANCES	ADVANCE ID	Primary identifier for a loan or mortgage.	TradeSum > LOAN_ID > demoEDW
ADVANCE/TRADE BALANCES	LEGAL ENTITY ID	Unique Identifier for a business partner.	Trade > MEMBERRID > demoTrade
ADVANCE/TRADE BALANCES	LEGAL ENTITY ID	Unique Identifier for a business partner.	TradeSum > MEMBER_ID > demoEDW
ADVANCE/TRADE BALANCES	LEGAL ENTITY NAME	The name of the business partner. This name may or may not be the fully legal name of the business partner.	Trade > MEMBERNAME > demoTrade
ADVANCE/TRADE BALANCES	LEGAL ENTITY NAME	The name of the business partner. This name may or may not be the fully legal name of the business partner.	TradeSum > MEMBER_NAME > demoEDW

METADATA AND THE REGISTERED GOVERNANCE STAKEHOLDER...
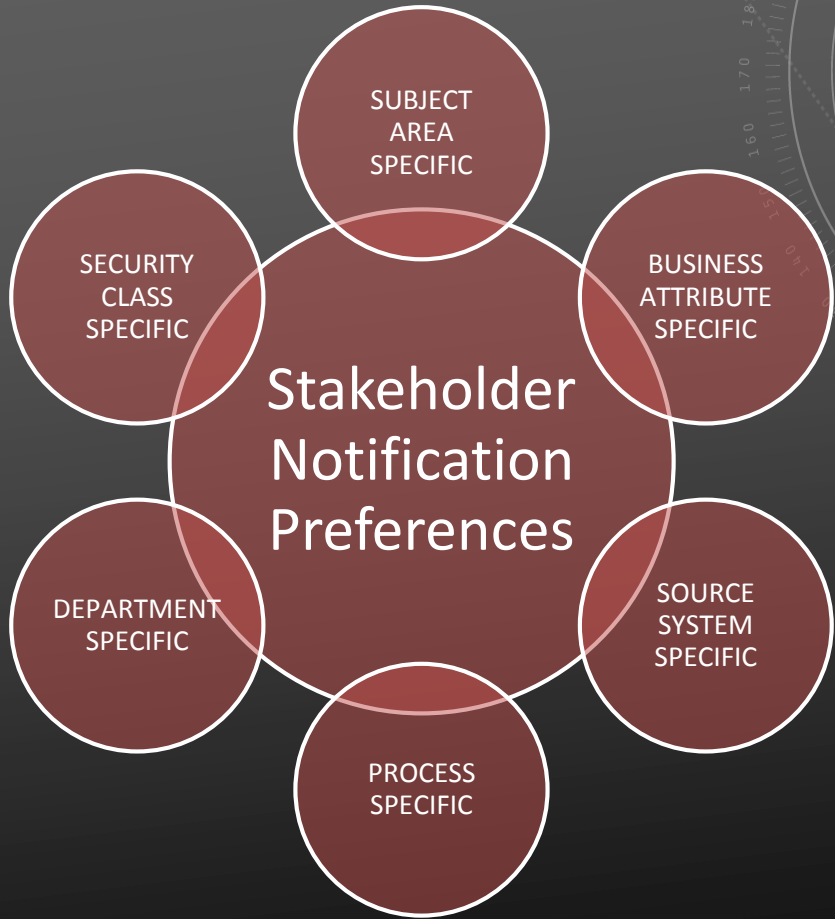
A SUBSET OF THE GOVERNANCE ARCHITECTURE COMPONENTS
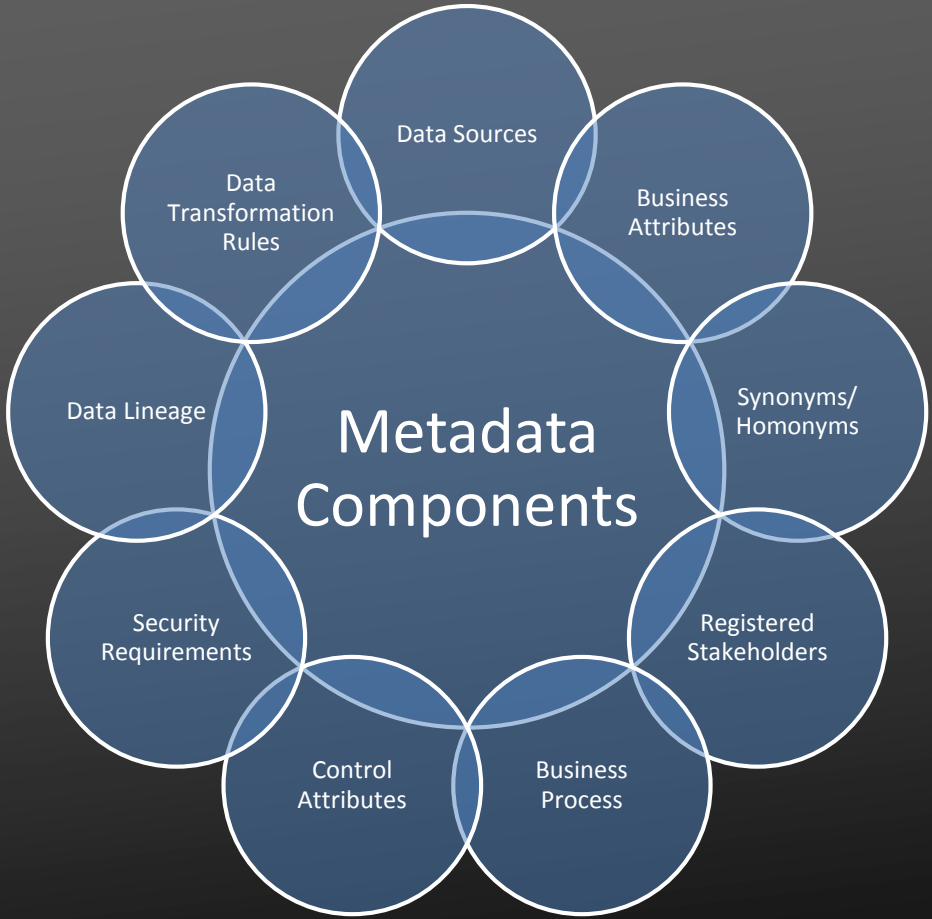
LINKING BUSINESS PROCESS TO REGISTERED STAKEHOLDERS IS ANOTHER COMPONENT OF THE DATA GOVERNANCE ARCHITECTURE

Data Objects (Data Elements)

Info Sources (Applications)

Data Subject Areas

Business Process

Are stored in

Which are part of

Based on

Grouped into

Related to

Through various

By

Data Sources (Databases)

Business Attributes (Business Glossary)

Registered Data Governance Stakeholders

Business Units (Internal and External Stakeholders)

Owner

Steward

Consumer

Custodian

METADATA VIEW OF TARGETED STAKEHOLDER NOTIFICATION

"News" is defined as a difference that makes a difference.
Gregory Bateson

SUBJECT AREA SPECIFIC

BUSINESS ATTRIBUTE SPECIFIC

SECURITY CLASS SPECIFIC

Stakeholder Notification Preferences

SOURCE SYSTEM SPECIFIC

DEPARTMENT SPECIFIC

PROCESS SPECIFIC

KEY PERFORMANCE INDICATORS (KPI)

- Health of the Data Assets
- Additional Assets in the Information Value Chain
- Data Structure Changes
- Data Definitions Changes
- System of Record Changes
- Data Ownership Changes

THE REGISTERED GOVERNANCE STAKEHOLDER RELATIONSHIP IS DYNAMIC AND CHANGES WITH BUSINESS EVENTS

- Organizational Realignment Changes Current Needs
- Data Security changes across the Data Universe
- Process Changes alters the RACI Aspect
- System Changes alters the Data Sources
- Data Redefinition changes the Business Needs

TRACKING PROGRESS IN DATA GOVERNANCE ARCHITECTURE

DATA GOVERNANCE ARCHITECTURE MATURITY METRICS

- Number Business Attributes Defined
- Number Data Controls Implemented
- Incidents Reported and Resolved
- Percentage of Bank Departments Included
- Percentage of Bank data within the BI Solution
- Number of procedures implemented
- Legacy Database Retired

MEANINGFUL MEASURES BY DATA GOVERNANCE ARCHITECTURE METRICS

- **Number of data issues by problem type**

- **Dollar impact of error by system**

- **Number of adjustments by department**

- **Trending of data quality by subject area**

- **Data issues causing financial restatement**

- **Exception and out-of-range values are 'news'**

Questions

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