



# Data Management in the Context of Global Regulatory Reform

ISITC Industry Forum

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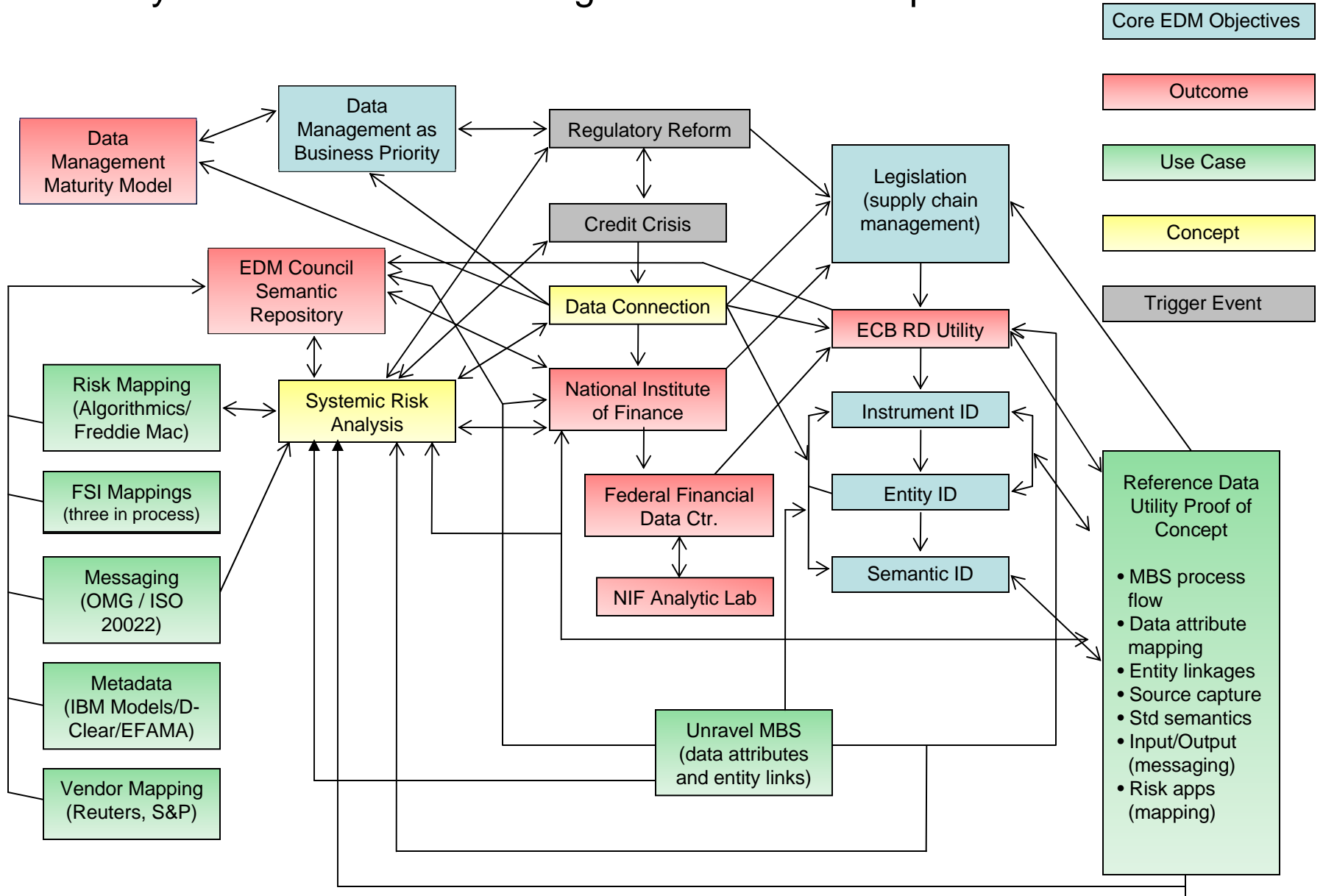
# Agenda

- Data Management Roadmap (context and objectives)
- Global Regulatory Activities (politics)
- Data Foundation (instruments, entities, attributes)
- Supply Chain Management (reference data proof of concept)
- Data Management Maturity (auditable benchmarking)
- Conclusion (action items)

# What We Have Learned

- Precise data is critical (world is complex and interrelated)
- Financial institutions are unruly animals
- Global regulatory environment based in a 1930's view of world
- We don't address systemic challenges unless we have to
- Data standards needed to analyze, compare and communicate are incomplete or missing
- Data management tools aren't in place to manage operational risk and effectively oversee global financial markets
- Systemic failure is everyone's worst nightmare

# Systemic Risk/Data Management Relationships



# Global Regulatory Reform



# Global Regulatory Themes

- Rule of Three (blame, analyze, reality)
  - Immediate Stability
    - Pump in \$/£ to stimulate credit market
    - Capital reserve, strengthen guarantee, stringent collateral requirements
  - Increase Transparency
    - Derivatives (listing, central clearing, reporting)
    - Harmonization of accounting principles and mark-to-market principles
  - Reorganize Regulatory Structure
    - Politics, infighting, opposition to government intervention
    - Global cooperation on data and data infrastructure (standards and links)
  - Address Systemic Risk
    - Interconnections and relationships (risk can have systemic implications)
    - US Financial Stability Agency, EU Financial Stability Board, strong central banks

# Hot Areas of Activity

- Global regulatory reform is still on track (politics are nasty business)
- Structured finance on the rebound (FSI use of exotics and high appetite for risk)
- Derivatives transparency and central clearing
- Timing for stimulus exit/monetary policy tightening (central bank discussions)
- Stronger capital reserve requirements and enhanced depository rules
- Accounting standards (XBRL) and less off sheet accounting
- Oversight over credit ratings agencies (hearings underway)
- Data harmonization and global cooperation among regulators (G-20 discussions)

# Systemic Oversight

## Systemic Risk

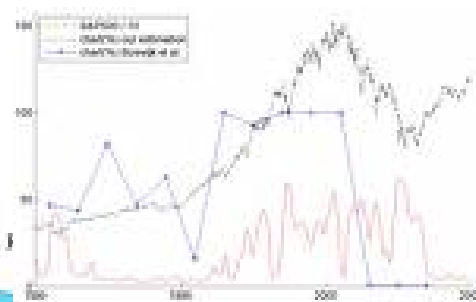
Assessment of the interrelationships and interdependencies of factors to determine the impact of specific events on the overall financial system (likelihood of cascading failure)



$$e^{i\pi} + 1 = 0$$

$$e^{i\mathcal{U}} = \cos(\mathcal{U}) + i \sin(\mathcal{U})$$

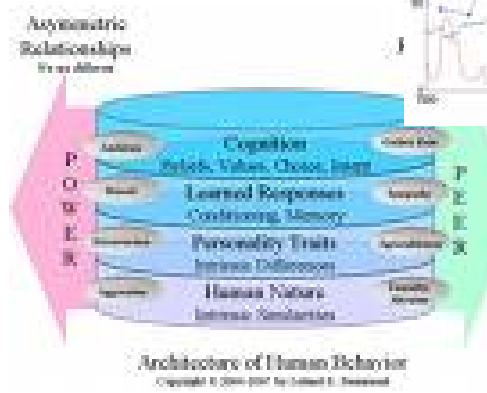
$$\lim_{n \rightarrow \infty} \left( 1 + \frac{1}{2} + \dots + \frac{1}{n} - \log(n) \right)$$



$$V - E + F$$

$$\frac{1}{2} \frac{B}{(2\pi)^2} \sqrt{\frac{1}{n}}$$

$$e^{uE}$$



Psychology



# Systemic Risk Implications

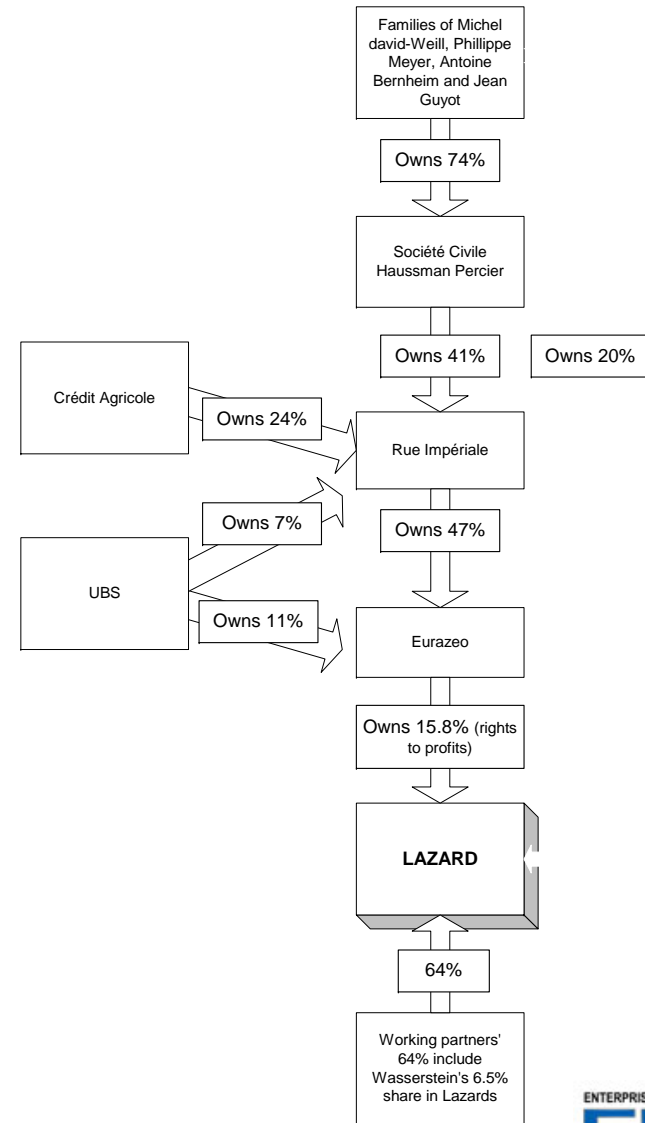
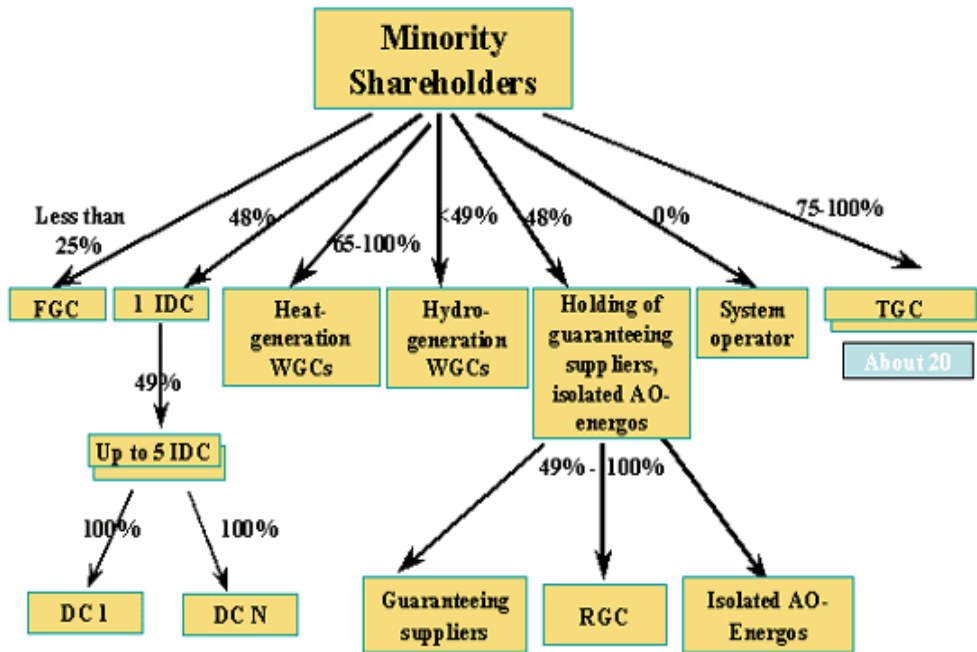
- Past Crisis (drivers)
  - AML/KYC: on-boarding and money flow
  - LTCM/Enron: networked entity relationships
  - Lehman/AIG: links between instrument, portfolio, issuance, ownership, rating, collateral, exposures, obligations, guarantee
- Capitalist vs. Systemic Risk
  - Existing: Obligation, recovery and profitability
  - Additional: Single name exposure and jump to default (based on multiple scenarios)
- Scenario Analysis (interconnections)
  - Legal characteristics of instrument/portfolio
  - What is being traded and with whom
  - Obligations related to trading, managing, clearing, settlement, custody
  - Compliance with terms of indenture, redemption, maturity, priority, exercise
  - Terms and parameters for payment, repayment and reinvestment
  - Restrictions and eligibility requirements

# Data Requirements for Systemic Risk

- Foundation of Systemic Analysis
  - **Instruments:** issue vs. instrument level, derivatives, short-term, loans, etc.
  - **Business Entities:** risk assessment and automation of post-trade processes
  - **Semantics:** data that is trusted to be “fit for purpose” without reconciliation
  - **Market Data:** prices for evaluated trading “off exchange”
  - **Positions and Transactions:** holdings and exposure
  - **Macroeconomic Indicators:** economic and predictive analysis
- These are the building blocks of every business process. If the data foundation isn't solid, the analytical house becomes weak

# Business Entity Identification

## Industry structure in 2008



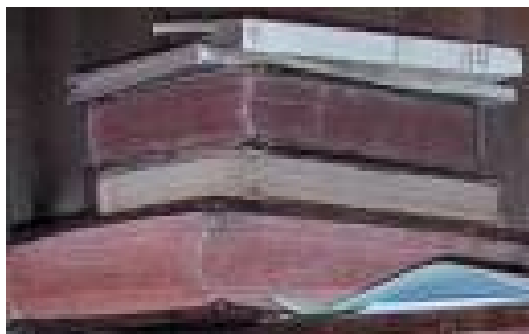
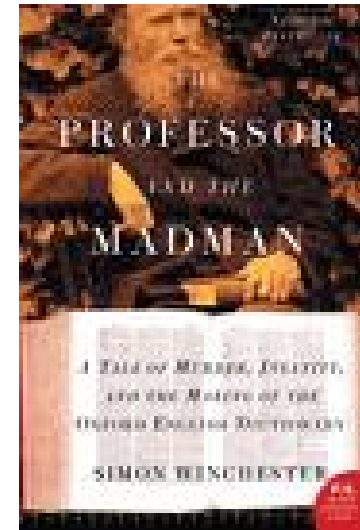
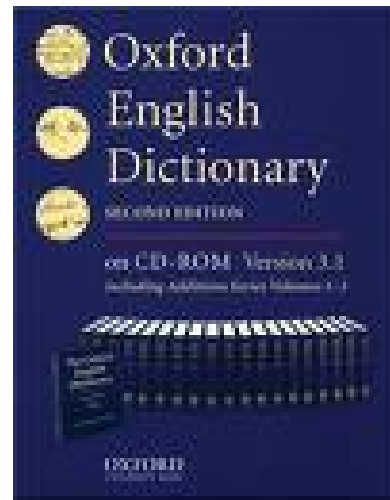
# Entity Identification

- Renewed interest for systemic oversight and single name exposure analysis (recognized as a key requirement)
- Entity Identification Roadmap
  - **Confusing Issue:** compounded by history, ISO/SWIFT bureaucracies, closed meetings and entrenched self interest
  - **Tactical Approaches:** internal entity ID challenges addressed tactically as a business requirement (cost of conversion and challenges of one-to-one mapping are significant)
  - **SWIFT/ISO Story:** SWIFT plan to clean BIC and assign ID's to missing corporate issuers is virtually identical to ISO WG8 pursuit of “issuer and guarantor” codes. Standard bodies working without coordination and at cross purpose
  - **Proprietary Story:** A number of commercial data providers have proprietary identifiers that could be used for entity identification (i.e. S&P/Avox, Factset, Reuters, Bloomberg, WM, Telekurs, Dun & Bradstreet) – adds to the confusion

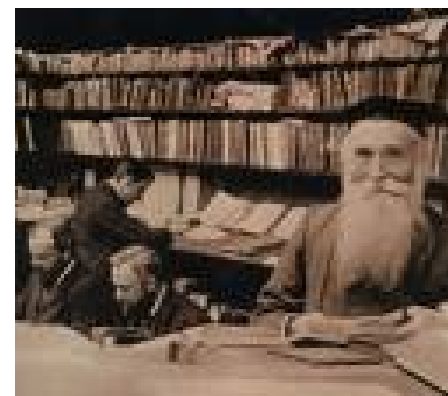
# Entity Identification (current status)

- November 12 meeting in Frankfurt (ISO, SWIFT, ECB, WM, EDMC) to gain alignment on requirement – **conceptual agreement achieved**
- Clarification on the Status of BIC
  - Flag parent BIC (underway)
  - Enriched directory (legal entity name validated against official lists; minimum core attributes)
  - Unravel multiple BIC's (BIC 1 is parent all others are network addresses)
- IGI to be Incorporated into BIC Process
  - Financial entities do not manage entity hierarchies via “role-based” identifiers
  - IGI and BIC are both ISO standards – coordinate in response to industry requirements; the work on IGI work can be incorporated into BIC standard
- Regulatory process (law) to mandate BIC and maintain against corporate actions being explored (central bank consideration underway)
- Commercial structure under review (most likely = entity pays for being registered, BIC 1 is free, SWIFT maintains basic legal hierarchy and relies on CDP to fill gaps, BIC network address is chargeable)

# It's All About Semantics



Metadata  
isn't a bad  
word



# Foundation: Standard Semantics

- Lessons from
  - Greeks (Plato's Kratylos; Aristotelian principles of classification)
  - Persians (Al-Suhrawardi Stoicism)
  - Bible (human unification post Great Flood until Tower of Babel)
  - Information industry (basis of search and retrieval)
- Semantics precision is essential to achieve the prime directive
  - Data that users have confidence to be fit for purpose without reconciliation and transformation
  - Different “data dialects” are the enemy of automation
  - Inconsistent semantics are the reason why we're stuck in “mapping hell”
  - First requirement for all complex systems management is to get the language straight
- Not an IT issue – don't confuse with XML schemas, technical data models and messaging formats

# Semantic Repository

- The most important information industry concept since TCP/IP
- Semantics Repository Status
  - Formal and factual representation of reality (things, facts and relationships) – philosophy validated by SME
  - Completed static data for traded instruments (model updated)
  - Deep into OTC derivatives and dated terms (market data)
  - Attracting serious attention from FSI (mapping and integration), regulators (comparison and source mark-up), vendors (cost of collection), academia (semantic importance) and semantics community (web 3.0)
  - Use cases for risk applications, integration, messaging, metadata underway
- Technical enhancements to diagrams, archetypes, and spreadsheet structure
- Standard semantics make source tagging achievable, facilitate comparability, are the key to data integration and form the building blocks for regulatory oversight

# Repository Applications Mapping

- **Risk** (Algorithmics, Freddie Mac):
  - Evaluate Repository for risk management applications
  - Identify missing semantic concepts for risk management
  - Determine relationship between semantic and logical mapping
- **Mortgage-Backed Securities** (IBM Research, ECB, NY Fed, SWIFT, Freddie Mac):
  - MBS Process Flow: from loan → mortgage pools → tranches → tranche pools → structured finance instruments
  - Semantic tagging of MBS (from semantic facts/static business model) to logical model
  - Risk application use cases (vendor, user, regulator)
- **Messaging** (SWIFT):
  - Identification of missing semantic concepts
  - alignment with ISO 20022
- **Integration** (three financial institutions):
  - Basis for internal mapping (eliminate data silos and spreadsheets)
  - Alignment of metadata repositories
- **Metadata** (IBM Models Group, Reuters, Dclear, EFAMA):
  - Mapping relationship between Semantics Repository and internal metadata repositories

# Supply Chain Management

Reduce Transformation Requirement – Source Mark-Up at Issuance



# Supply Chain Management

- Reference Data “Utility”
  - European Central Bank
    - Appalled at the state of data quality; complexity oversight requires automation; Tower of Babel; capture data from source
  - National Institute of Finance
    - Consortia of industry, regulators and academia (identical conclusion)
- Common Goals
  - Centralize data collection via national law (to compel compliance by issuers)
  - Global coordination on data infrastructure to achieve systemic oversight
  - Implement missing content standards (content tags and identifiers) to unravel networked linkages
  - Collect instrument reference data from point of creation
  - Build and maintain factual entity hierarchies
  - Construct system-wide transactions and positions database
  - Support analytical capabilities to monitor systemic risk

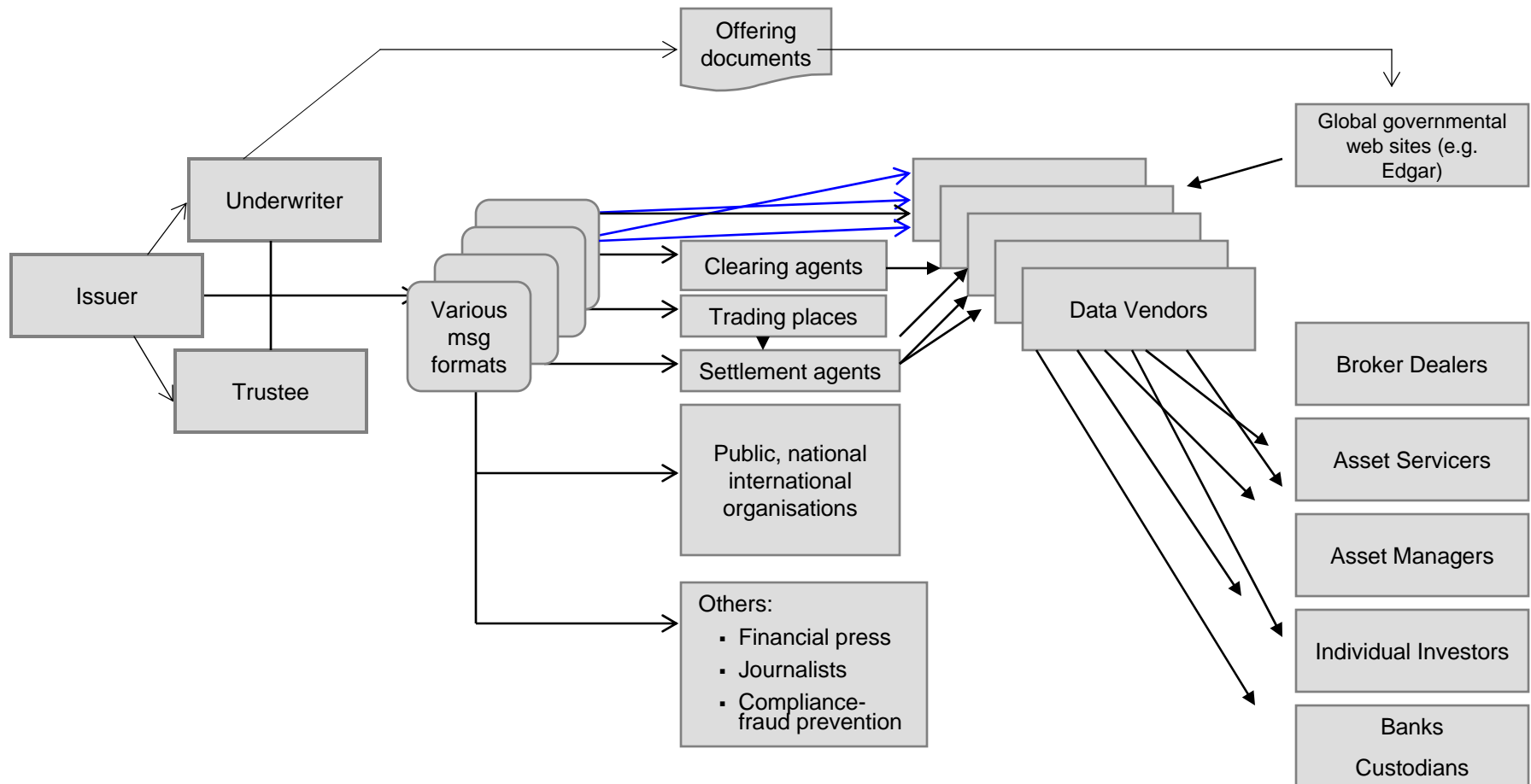
# NIF/ECB Activities

- Alignment of ECB “reference data utility” and NIF “federal data resource center” into single conversation
- Pace and level high [i.e. Don Kohn (Vice Chair, Fed Board of Governors), Mary Shapiro (Chair, SEC) and Kathleen Casey (SEC Commissioner), numerous Hill members and staff]
- US legislation being sponsored by Senator Jack Reed (Member Senate Banking Committee and Chair, Subcommittee on Securities, Insurance, and Investment)
- National Academy of Sciences to prepare a formal analysis of data and analytical requirements (brings in academia)
- Regulators and central banks on board with data requirement objective (doing own analysis)
- EDM Council (Coordinating the reference data repository “proof of concept;” Managing the composite business case; Drafting the data requirements)
- Core message - create the “data foundation required for systemic oversight” (Semantics Repository is at heart of POC and legislation)

# Reference Data POC

- Target is regulators, legislators and market authorities (feasibility of reference data repository)
  - Unravel MBS process to identify essential data attribute and entity linkages (complete process flow diagram)
  - Collect instrument reference data from issuance documents (standard template using EDMC Semantics Repository)
  - Map all relationships (ownership, instrument, rating, collateral, exposures, obligations, guarantee, issuance, etc.)
  - Define IT architectural requirements
  - Create database including API's and messaging (live data)
  - Map data into risk models to determine probability of default and loss given default
- SEC's Interactive Data Initiative, SDMX, Data Transparency Act, XBRL, SWIFT Corporate Actions Project, OMG – all about data tagging

# Overview of Data Flows (Current Environment)





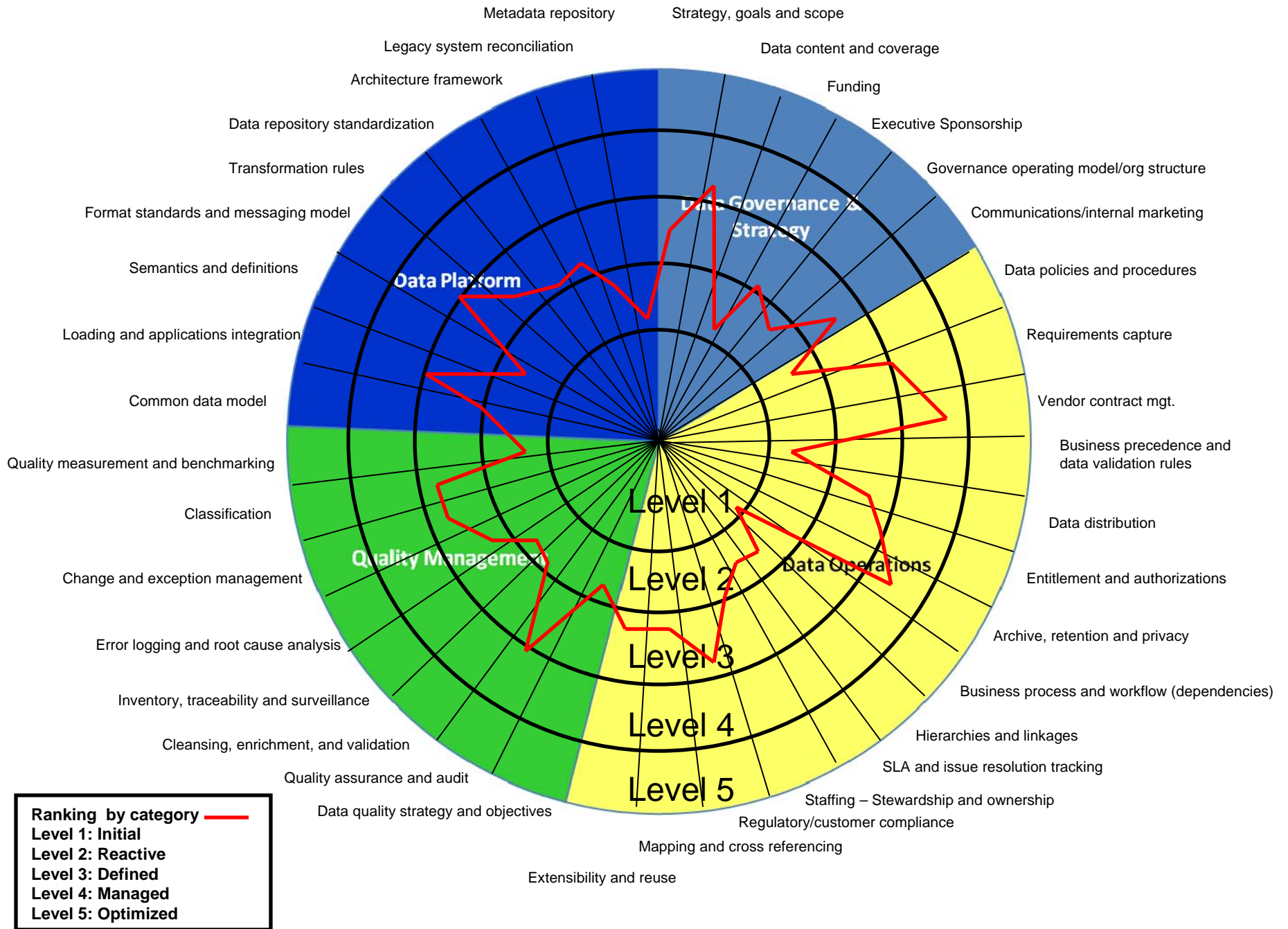
# POC Status

- Core group formed (meeting weekly)
- Governance process to ensure full industry transparency (defined)
- Architectural structure for POC (defined)
- Process flows for MBS defined (completed)
- MBS semantic layer extracted (completed)
- Mapping between semantic and logical models (completed)
- Mapping between MBS database and risk applications (initiated)
- Populate POC database with mortgage data including missing linkages (initiated)

# Data Management Maturity Model

- Top practitioner-related initiative (broad interest)
- In fund raising mode with Carnegie Mellon (FFRDC status opens doors)
- Positioning document created and distributed (Defense, DHS, Legislators, Regulators, NSF, NIST, Treasury, Federal Reserve, BIS, IMF)
- Academia interest and request from DAMA to collaborate with their “Body of Knowledge”
- Core model discussions with members while pursuing funds

# Example Audit: Measuring an Institution's Data Practices in DMM Framework



# DMM Methodology

- Development process team – Software Engineering Process Management Group, Computer Emergency Response Team and EDM Council
- Core framework based on structured interchange sessions with stakeholders using attributes of CMMI and RMM models
- Four Phases
  - Core model: extension of underlying structure and description of fundamentals of financial data project management (practical translation of DM into applications environments)
  - Maturity Model: definition of specific components and business processes of effective data management (appraisal pilot programs)
  - Training and Internal Audit: DMM instructor and appraiser training courses to promulgate adoption including appraisal software and dashboard tools (benchmarking and program evaluation)
  - Certification: independent evaluation and certification of capability

# Conclusion

- Data connection to systemic risk is clear
- Data comparability mandate from global regulators (international cooperation, content standards, data sharing for transparency)
- More efficient chain of supply (increase quality, reduce cost)
- Get the Data Foundation Right
  - Embrace semantics (metadata)
  - Cross-link to standard entity identifier
  - Conversion, system reconciliation and one-to-one mapping (short term cost)
- Enterprise data management (EDM) is a regulatory reporting, compliance, risk mitigation and operational efficiency objective (logical and inevitable)

# Contact

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