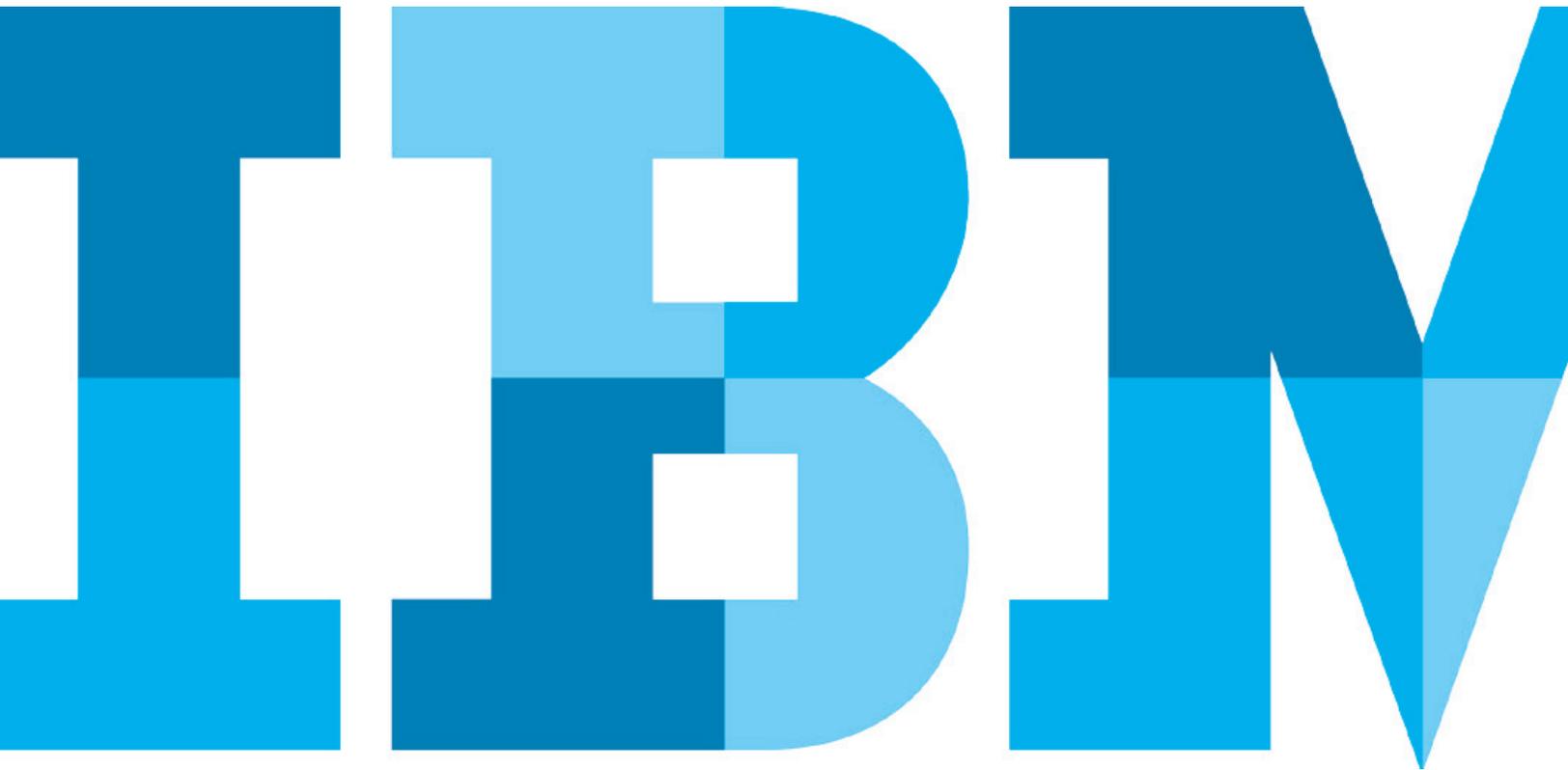


Using IBM Banking and Financial Markets Data Warehouse to Support Dodd-Frank



Compliance Challenges

Financial institutions are facing a series of compliance challenges. A number of regulatory initiatives have been put in place in an attempt to mitigate the risks that financial institutions are facing. These initiatives include Basel II/III, IFRS/IAS, MISMO, Sarbanes-Oxley Act, and now Dodd-Frank.

The United States Dodd-Frank Wall Street Reform and Consumer Protection Act, known as Dodd-Frank, was signed into law on 21 July 2010, a far-reaching act that involves significant financial regulatory reform. Dodd-Frank aims to:

- Promote financial stability by improving accountability and transparency in the financial system
- Mitigate risks associated with too-big-to-fail banks
- Protect the U.S. taxpayer by ending bailouts
- Protect consumers from abusive financial services practices

In order to help financial institutions meet these ever increasing compliance challenges, IBM® Banking and Financial Markets Data Warehouse provides the combination of expertise in modeling techniques with deep industry knowledge and experience gained over a number of years. A key advantage of IBM Banking and Financial Markets Data Warehouse is that it provides a business focus on what is required for a given business topic, and allows the underlying implementation to follow.

Financial institutions are faced with numerous compliance requirements. It is imperative that there is as much reuse as possible in the underlying I.T. Infrastructure. This is especially the case in terms of data consolidation and reporting requirements. As the worldwide financial regulatory approach switches from light touch supervision to tougher rule enforcement, there is a growing burden on financial institutions to provide more information to regulatory agencies, with clear demonstration of compliance. So in addition to the procedural and governance changes prescribed, there is an emphasis on quantitative measurement of compliance.



Figure 1. Compliance challenges facing financial institutions

In order to understand how these new rules impact them, organizations are undertaking detailed analysis to extract the critical business data elements and key measures from these detailed (and often wordy) final rule documents. This is very time consuming, as many of the documents relating to the rules are hundreds of pages in length.

In order to understand the multiple and inconsistent requirements from numerous regulatory agencies the critical data elements and measures identified must be translated from the taxonomy of the individual regulatory agencies into common business terms used by the financial institution. They must also be mapped to the financial institution's available information to determine from where the data is sourced to comply with the reporting requirements. This mapping also feeds into a gap analysis to determine the level of coverage for the new/revised requirements, and to inform I.T. development and data remediation strategies, if required.

Organizations are struggling to meet all of the competing demands with their limited resources.

Understanding Dodd-Frank

Dodd-Frank changes the U.S financial regulatory framework, both through new legislation and through oversight and supervision by multiple financial regulatory agencies, reporting annually to Congress. Dodd-Frank brings an increased level of coordination between the regulatory agencies, with joint rules being issued where jurisdiction overlaps. Agencies include:

- Financial Stability Oversight Council (FSOC)
- US Commodity Futures Trading Commission (CFTC)
- US Securities and Exchange Commission (SEC)
- Federal Deposit Insurance Corporation (FDIC)
- Office of Financial Research (OFR)
- Consumer Financial Protection Bureau (CFPB)

With the increase in regulatory oversight come new and amended requirements for registration with the various regulatory agencies. Clarification has been given regarding definitions, eligibility thresholds and exclusions that apply. Registrations that are required include:

- Major Swap Participants (MSP) / Major Security-Based Swap Participants (MSBSP)
- Swap Dealers (SD) / Security-Based Swap Dealers (SBSD)
- Clearing Agencies
- Private Fund Investment Advisers
- Large Traders - identified by an assigned Large Trader Id (LTID)
- Legal Entities - identified by an assigned Legal Entity Identifier (LEI)

A number of the key regulatory agencies have been newly established as a result of the Act, including:

Financial Stability Oversight Council (FSOC)

New governing body that brings together the expertise of the federal and state financial regulators, and is authorized to:

- Facilitate regulatory coordination among the financial regulatory agencies
- Facilitate information sharing and collection of more data when required
- Designate nonbank financial companies for consolidated supervision
- Designate systemic financial market utilities and systemic payment, clearing, or settlement activities
- Recommend new or stricter regulatory standards if it determines that certain practices or activities pose a threat to financial stability
- Break Up Firms that pose a grave threat to Financial Stability of the United States

Office of Financial Research (OFR)

Supports the FSOC, with responsibility for collecting and analyzing data from federal and state financial regulatory agencies, the Federal Insurance Office, and potentially from bank holding companies and nonbank financial companies. The OFR has a role in monitoring and analyzing data and conducting research in support of the identification and mitigation of risks in the financial system.

Consumer Financial Protection Bureau (CFPB)

Established to protect U.S. consumers by implementing federal consumer financial laws regulating consumer financial products and services.

Dodd-Frank titles

- | | |
|------|----------------------------------------------------------------------------------------------------------|
| I | Financial Stability |
| II | Orderly Liquidation Authority |
| III | Transfer of Powers to the Comptroller of the Currency, the Corporation, and the Board of Governors |
| IV | Regulation of Advisers to Hedge Funds and Others |
| V | Insurance |
| VI | Improvements to Regulation of Bank and Savings Association Holding Companies and Depository Institutions |
| VII | Wall Street Transparency and Accountability |
| VIII | Payment, Clearing, and Settlement Supervision |
| IX | Investor Protections and Improvements to the Regulation of Securities |
| X | Bureau of Consumer Financial Protection |
| XI | Federal Reserve System Provisions |
| XII | Improving Access to Mainstream Financial Institutions |
| XIII | Pay It Back Act |
| XIV | Mortgage Reform and Anti-Predatory Lending Act |
| XV | Miscellaneous Provisions |
| XVI | Section 1256 Contracts |

IBM Banking and Financial Markets Data Warehouse Components

IBM Banking and Financial Markets Data Warehouse is a family of models that accelerates the design of enterprise data warehouse business intelligence solutions, driven by financial-services-centered business requirements. It has the flexibility to create a range of data warehouse solutions from departmental data marts to enterprise-wide data warehouses. The data warehouse is designed for iterative implementation, adding segments of business capability during short development cycles, while minimizing rework associated with the incorporation of new business requirements over time.

Frequently the problem for organizations is not the amount of data available, but rather the consistency, accuracy, timeliness and complexity of it. IBM Banking and Financial Markets Data Warehouse offers not just a set of an isolated set of terms, logical models, and analytical requirements, but an integrated set of models that provides traceability throughout the layers of the information architecture back to source systems.

Business Terms

The Business Terms glossary enables non-technical business experts to describe and define, in their own words, the concepts they use every day. Clearly defined business terms help standardization and communication within an organization. Mappings to the other models make it possible to create a common, enterprise-wide picture of the data requirements and to transform these requirements into I.T. data structures.

The glossary is a comprehensive list of terms pertaining to financial services and general business that includes:

- Definitions written in plain business language
- Detailed data elements that specify what each business term means for the financial services organization
- Terms that might be related to one another through relationships

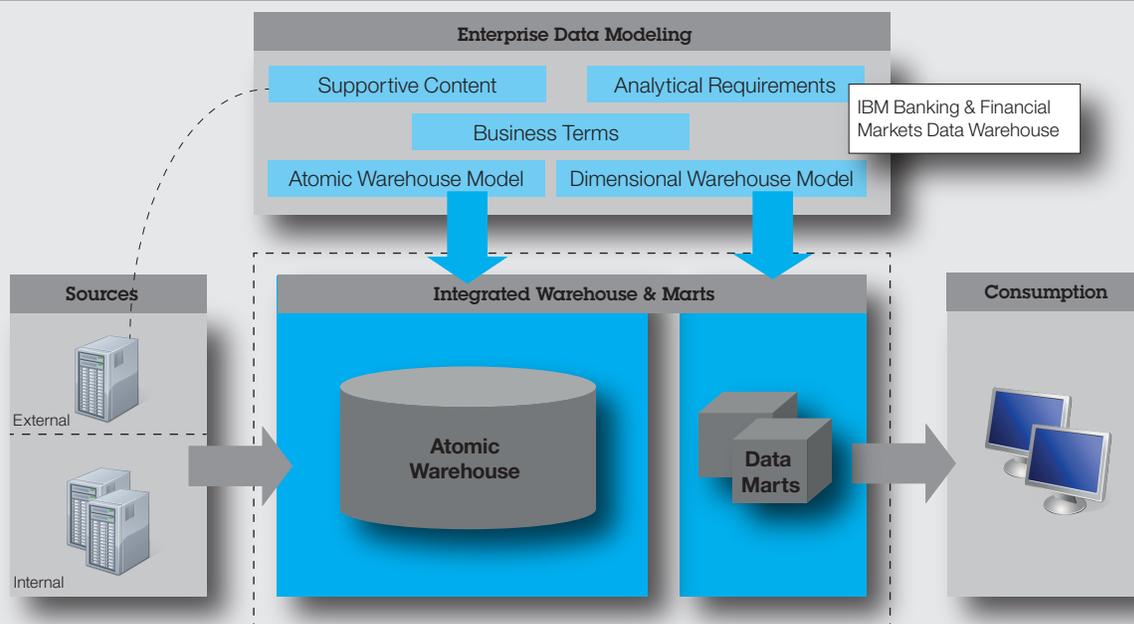


Figure 2. IBM Banking and Financial Markets Data Warehouse solution architecture

Analytical Requirements

Analytical Requirements reflect the most common queries and analyses for business performance measurement and reporting, while supporting other analytical functions, such as adhoc reporting and decision support. They enable rapid scoping and prototyping of data marts, which provide a subject-specific analytical layer in a data warehouse solution.

Each Analytical Requirement can be divided into measures, which are numerical facts that convey quantitative information of importance to the organization, and dimensions that categorize measures. These measures and dimensions are mapped to both the Atomic and Dimensional Warehouse Models, so that the scoping of the reporting and analysis requirements automatically selects the most appropriate data warehouse entities and attributes to support those requirements. Analytics development teams can use these Analytical Requirements to create designs for specific data marts or dimensional solutions that can serve as the source for a range of reports and charts.

Atomic Warehouse Model

The Atomic Warehouse Model is a logical, specialized model derived from the Business Terms. It is optimized as a data repository that can hold long-term history, usually across the entire enterprise.

It provides the data design support needed to create a uniform model of the enterprise-level business requirements as specific, flexible and efficient structures dedicated to the long-term storage of historical facts. It features a flexible atomic data area (primary data storage area) as well as the typical summaries needed by most financial institutions to roll up the detail data for analysis purposes. A portion of the Atomic Warehouse Model is generated in the initial project phase. Other areas can be generated as the financial institutions covers more business areas over time.

Dimensional Warehouse Model

The Dimensional Warehouse Model is a logical model derived from the Business Terms and the Analytical Requirements and provides an optimized data repository for supporting analytical queries. It provides the data design support needed to transform the enterprise-level business requirements into business-specific and efficient structures dedicated to the design of a dimensional data repository.

This repository holds sufficient and complete data to meet the needs of business user analysis. Dimensional models are easily understood by business users. They are optimized for data querying rather than for transactional speed, and their structure makes it is easier to extend them to support new data requirements. The Dimensional Warehouse Model contains star schema style dimensional data structures organized around fact entities that support the Analytical Requirements.

Supportive Content

Supportive Content provides a method of mapping both external and internal terms from business standards and other requirements to the Business Terms and to the Atomic and Dimensional Warehouse Models. This helps business users understand how such business terms are represented in the models, using the naming and definitions of the source. The benefit of such a hierarchy is in logically organizing the data requirements into cohesive groupings, and in translating requirement data needs into their support in the data model.

IBM Banking and Financial Markets Data Warehouse Support for Dodd-Frank

IBM Banking and Financial Markets Data Warehouse is at a mature stage, having been developed over a number of years, and provides comprehensive data coverage for all lines of business in a financial institution. The primary area of model development for Dodd-Frank support has been in Supportive Content, since this part of the model reflects the taxonomy used by the regulatory agencies.

Supportive Content identifies critical data elements required for Dodd-Frank in the terminology of the regulatory agency, with a context of why they are required.

The level of coverage for Dodd-Frank data requirements in the other areas (Business Terms, Atomic Warehouse Model, Analytical Requirements and Dimensional Warehouse Models) is already extensive, and has been enhanced as required.

Dodd-Frank rulemaking. An evolving regulatory landscape

The regulatory changes required to implement the Dodd-Frank Act are evolving over time. The rules cover various aspects of the new legislation, including regulation enforcement, potential sanctions, exemptions, and the process changes, registration, monitoring and reporting requirements for financial institutions and market participants.

Due to the complexity of the financial services industry and the range of regulatory agencies with supervisory authority, hundreds of new rules are being issued over a period of several years. Early publication of proposed rules is part of a consultation process during which public feedback is welcomed. The final

versions of the rules address the public comments, and organizations need to incorporate any amendments into their implementation plans, to meet the specific effective date for compliance with that rule.

Iterative development approach

As Dodd-Frank continues to evolve, support in IBM Banking and Financial Markets Data Warehouse continues to be enhanced on an iterative basis, similar to the approach taken with Basel. As part of the ongoing development of the models, the list of finalized Dodd-Frank rules was reviewed, and was prioritized by the direction set by the Dodd-Frank user group. The user group, consisting of a number of IBM Banking and Financial Markets Data Warehouse customers with an interest in Dodd-Frank, actively participated throughout the development, validating the approach and providing feedback on the content as it evolved.

Existing support for Dodd-Frank included:

- Swaps Reporting
- Legal Entity Identifier
- Truth In Lending
- Retail Foreign Exchange

The following rules were prioritized for the latest release:

Large trader reporting

Issuing Agency: US Securities and Exchange Commission (SEC)

Registration of large traders with the commission

A new regulatory filing (Form 13H) has been issued to traders, and is designed to collect basic identifying information about large traders. Volume and value thresholds relating to specific types of financial market transactions within specified time periods (identifying activity level) are used to identify large traders who must register to be assigned a Large Trader Id (LTID). It is intended that the registration is at the level of the ultimate parent company, though suffixes might be used to differentiate subsidiary entities. Large traders are required to provide their LTID to broker-dealers with whom they hold accounts.

Recordkeeping, reporting, and monitoring duties imposed on registered broker-dealers that service large trader customers.

Under this new rule, broker-dealers must track LTIDs for traders for whom they hold accounts, and must include this information in their transaction reporting to the SEC (via the Electronic Blue Sheets system) as required. Broker-dealers are also required to perform a limited monitoring role regarding customers who have not provided an LTID in order to identify possible unidentified large traders. This analysis of customer transaction activity is also conducted against the identifying activity level.

Critical data elements have been identified for large trader registration, for transaction-level reporting to the SEC and for monitoring of trader transaction levels.

This rule gives the SEC the authority to gather more market activity data, facilitating:

- Assessment of impact of large trader activity on securities markets
- Reconstruction of trading activity following periods of unusual market volatility
- Analysis of significant market events for regulatory purposes
- Investigative and enforcement activities

Further definition of Swap, Security-based swap/ swap agreement, Mixed swaps, and Security-based swap agreement recording

Joint Issuing Agencies: US Commodity Futures Trading Commission (CFTC) and US Securities and Exchange Commission (SEC)

This rule amends existing rules and interpretations under the Commodity Exchange Act and Securities Exchange Act.

Further definitions of the terms swap, security-based swap (SBS), and security-based swap agreement have been provided, in order to provide greater clarity around product definitions. This rule contains detailed explanations in response to questions and comments from the public, and provides definitions of the swap and SBS products that:

- Are based on characteristics including terms and conditions of the instrument and the nature of prices, rates, securities, indexes, or commodities
- Include transactions and entities that might be structured to evade the requirements of Title VII

- Include details of exclusions, whether codified (bright-line tests), or evaluated based on particular facts and circumstances (balancing tests)
- Define regulatory authority: swaps are regulated by the CFTC; security-based swaps are regulated by the SEC; the CFTC and SEC jointly regulate mixed swaps
- Prescribe books and records requirements for Security-Based Swap Agreements
- Provide clarity and enhanced legal certainty regarding the appropriate classification of Title VII instruments

The rule therefore clarifies which transactions are outside the scope of the definitions (for example, traditional insurance products), and which are within (for example, contracts for difference). It outlines the relationship between swaps and SBS's, and defines which products are to be treated as mixed swaps.

Further definition of Swap dealer, Security-based swap dealer, Major swap participant, Major security-based swap participant, and Eligible contract participant

Joint Issuing Agencies: US Commodity Futures Trading Commission (CFTC) and US Securities and Exchange Commission (SEC)

This joint rule defines the roles of a number of market participants and sets out the criteria that must be met by each. This includes requirements to register with the relevant regulatory agency, depending on the type and level of trading activity.

Swap Dealer and Security-Based Swap Dealer definitions focus on a person's engagement in certain types of activities involving swaps or security-based swaps.

Persons that meet either of those definitions are subject to statutory requirements related to, among other things, registration, margin, capital and business conduct. Exclusions are provided where the dealing activity is not part of regular business, or where the level of activity does not exceed specified de minimus quantities. For the purposes of measuring dealing activity, it provides certain exclusions for transactions between affiliates and transactions for hedging of physical positions.

The Eligible Contract Participant (ECP) definition has been amended to make it unlawful for any person to engage in either swaps or security-based swaps transactions with Persons that are not ECPs on Swap Execution Facilities (SEFs), on Security-Based SEFs, or on a bilateral, off-exchange basis. Other amendments include an increased monetary threshold that governmental entities may use to qualify as ECPs; a standard for amounts invested on a discretionary basis by ECPs; and a specific exclusion for commodity pools in which any participant is not itself an ECP.

Major Swap Participant and Major Security-Based Swap Participant are defined as persons other than Swap/SBS Dealers, that satisfy a number of statutory tests. These tests are based on quantitative measures, for which thresholds are specified. The measures include substantial positions maintained in swaps/SBS's; outstanding swaps/SBS's resulting in substantial counterparty exposure; and financial entities deemed to be highly leveraged, relative to the amount of capital it holds.

Exclusions include positions held for hedging or mitigating commercial risk, and certain positions maintained by an employee benefit plan.

Use Case

There are two groups within the financial services industry directly impacted by the Large Trader Reporting rule: traders and broker-dealers.

The term large trader is defined as any person that (i) directly or indirectly, including through other persons controlled by such person, exercises investment discretion over one or more accounts and effects transactions for the purchase or sale of any NMS security for or on behalf of such accounts, by or through one or more registered broker-dealers, in an aggregate amount equal to or greater than the identifying activity level or (ii) voluntarily registers as a large trader by filing electronically with the Commission Form 13H.

Impact on traders

The Large Trader Reporting rule requires a trader that exceeds volume and value reporting thresholds set out in the identifying activity level, for particular types of financial market transactions, within specified timeframes, to register as a large trader with the SEC (unless they meet specified exemption criteria). The SEC assigns the trader a Large Trader Id (LTID), which must be provided to broker-dealers with whom they hold accounts.

Impact on broker-dealers

Under the rule, registered broker-dealers must:

- Maintain specified records of transactions effected by or through accounts of large traders as well as unidentified large traders
- Electronically report all transactions by such persons to the Commission upon request using the existing EBS infrastructure
- Perform a limited monitoring function to promote awareness of and foster compliance with the Rule

Broker-dealers are required to undertake a level of client activity monitoring, where a trader has not provided an LTID. Where a trader's volume and value fall within the identifying activity level for the period, they are classified as an unidentified large trader by the SEC. Transactions effected by or through the broker-dealer must be reported when they equal or exceed the reporting activity level for both, identified and unidentified large traders.

Support in the model components

Supportive Content

For each of the Dodd-Frank rules covered, the final rule documents and forms have been analyzed, and the critical business data elements extracted and placed in structured groups, according to why they are required.

The critical data elements in the Supportive Content have been mapped to the Business Terms, and to entities and attributes in the Atomic and Dimensional Warehouse Models. This mapping required a few enhancements to the model, as discussed below.

Organizations using IBM Banking and Financial Markets Data Warehouse to understand the availability of data in their data stores can use this mapping to trace from the Supportive Content through the layers of their information architecture to assess any possible data gaps.

In the case of the Large Trader Reporting rule, the following were the source documents analyzed:

- Large Trader Reporting Rule 13h-1 (SEC 17 CFR PARTS 240 and 249)
- Form 13H Large Trader Registration - new form to gather information required for registration of large traders
- Rule 17a-25 and the Enhanced EBS System - referenced for data elements required for transactional reporting to SEC

For example, Large Trader Identification Number LTID, is defined as: *“Identification number that uniquely and uniformly identifies the trader, as provided by the Securities and Exchange Commission. Under Rule 13b-1, large traders must register with the Commission by filing and periodically updating Form 13H. Upon receipt of an initial Form 13H, the Commission will assign and issue to a large trader a unique LTID. The large trader must disclose its LTID to all of its broker-dealers and must highlight to each such broker-dealer all accounts to which the LTID applies.”*

This item is mapped to the Regulator Assigned Identifier entity in the Business Terms, and the Atomic Warehouse Model entities Involved Party Alternative Identification and Involved Party Identification Type.

Business Terms

Although most of critical data elements identified from the analysis of the Dodd-Frank rules already had coverage in IBM Banking and Financial Markets Data Warehouse, some new objects have been added where required. Mappings from the new Supportive Content to the common Business Terms allows for reuse of existing definitions, and supports conformity across the organization, which aids in the comprehension of the Dodd-Frank information requirements, as well as providing a consistent set of terms across the many business considerations supported by and enterprise-wide view of information.

The enhancements primarily involve additional classifications for existing concepts such as Financial Market Instruments and In-

involved Parties. It also includes additional data elements relating to regulatory registration and filing.

For example Regulator Assigned Identifier is defined as: *“An identifier that is assigned to an Involved Party that is regulated by a regulatory body. The Involved Party is assigned a unique identifier for the purposes of registering or filing returns with that regulatory body.”*

Atomic Warehouse Model

Where appropriate, new objects have also been added to the Atomic Warehouse Model to support Dodd-Frank. However, as with Business Terms, the level of change required is low due to the maturity of the data models.

For example, the model provides sophisticated structures to capture and store information relating to the trading of financial markets products, and the complex set of involvements of the various parties involved in the transactions. These include the roles of the trader, broker-dealer, issuer and the reference entity of the instrument and the organization acting as primary listing exchange.

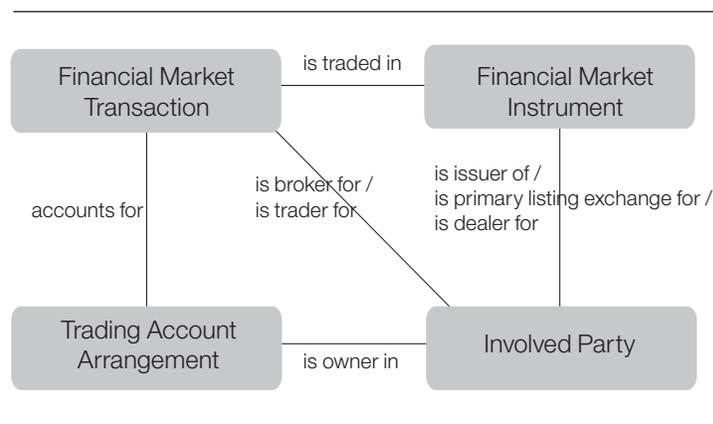


Figure 3. An example of entities in the Atomic Warehouse Model

Although the new objects have been added to the models to support Dodd Frank requirements, they are sufficiently generic to be applicable to other scenarios and jurisdictions.

For example, the entity Involved Party Regulatory Filing Status Type is defined as: *“Involved Party Regulatory Filing Status Type distinguishes between Involved Parties according to the standing of their regulatory authority filing status. For example, a person deemed to be a “Large Trader” filing with the Securities and Exchange Commission might have a number of different statuses over time, such as Voluntary Filing, Large Trader Inactive, Large Trader Reactivated, Large Trader Terminated. The list of possible Values for this Scheme is extensive and will likely be different and vary by geographic region and regulatory body.”*

Analytical Requirements

IBM Banking and Financial Markets Data Warehouse comprises a proven, flexible and scalable data warehouse infrastructure to address the following business reporting and analysis needs:

- Asset & Liability Management
- Investment Management
- Profitability
- Regulatory Compliance
- Relationship Marketing
- Risk Management
- Wealth Management

A number of these existing Analytical Requirements can be used in support of Dodd-Frank analysis and reporting. Some specific Analytical Requirements have also been added, where deemed beneficial, for example Trader Transaction Analysis has been added to support the requirement for both traders and broker-dealers to monitor and analyze trader transaction activity levels over time against specified thresholds.

Trader Transaction Analysis is defined as: *“To support the financial institution in the generation of reports and the analysis of Financial Markets Transaction Activity in relation to Dodd-Frank Large Trader Reporting Rule 13b-1 monitoring and reporting requirements. Also relevant to SEC transaction reporting.”*

Key measures include Transaction Value and Traded Volume, which are reused in a number of other analytical requirements. This reuse of measures ensures conformity of business measures use across the organization and is a key aid in the metadata management activities of a analytics environment within an organization. Measures become most useful when they are compared against each other or against specified thresholds under different headings. For example, Traded Volume of particular types of transaction, daily and monthly, transacted on behalf of specific traders.

Key dimensions include: Financial Market Instrument Type, Transaction Trader or Place of Trade. Dimensions can be reused in multiple analytical requirements, enforcing conformity of dimensions used in different analysis areas, enabling uniformity of reporting and the ability to cross-reference measures from different areas of analysis.

While this Analytical Requirement was developed to meet Dodd Frank requirements, it can be used as the basis for general regulatory reporting for other jurisdictions.

Dimensional Warehouse Model

New dimensional data structures have been added to the Dimensional Warehouse Model to support Trader Transaction Analysis, in line with the new Analytical Requirement. The new fact entity includes measures and dimensions described previously, and it supports the analysis and reporting requirements for both traders and broker-dealers.

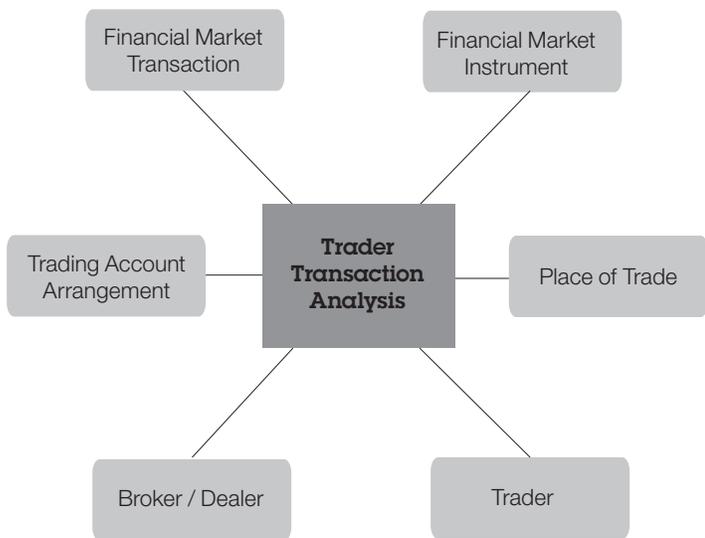


Figure 4. An example of structures in the Dimensional Warehouse Model

Project Scopes

IBM Banking and Financial Markets Data Warehouse contains a Dodd-Frank scope, in which the regulatory content is mapped to the data warehouse so that the scoping of the reporting and analysis requirements and supportive content automatically selects the most appropriate data warehouse entities and attributes that support those requirements.

Each project scope is anchored on a particular Analytical Requirement or area of Supportive Content, but only selects the subset of elements needed to address the particular Dodd-Frank data or reporting requirement. The scope of each project scope can then be extended to include the relevant pre-defined mappings that exist between the Analytical Requirement, Supportive Content, and the Atomic and Dimensional Warehouse Model.

The specific scopes for Dodd-Frank include:-

- DF - 17 CFR Part 1
- DF - Further Definition Of Swap Dealer 17CFR/DF - Further Definition Of Swaps SBSs 17CFR
- DF - Large Trader Reporting 17CFR240 and 249
- DF - Retail Foreign Transactions 12CFR349/DF - Retail Foreign Transactions 12CFR48

Each of the scopes identifies the critical data elements that need to be supported under the relevant regulation.



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