IBM Industry Models for Financial Markets

Financial Markets Data Warehouse

General Information Manual

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Executive Summary

The financial markets industry is tackling three core challenges head on. The first is focused on its medium-to-longer term future and how the organization perceives the issues of revenue and risk. Central to the decision about what risks to accept is the need to accurately quantify those risks for trades, hedge funds, counterparties and pricing. The management of risk is strategic to an organization's corporate intent and survival. The second area of focus is how to respond to the ever growing demands of regulatory compliance including requirements such as Dodd Frank, Basel III, FATCA, and others. The investments in meeting compliance requirements can be significant so the challenge is how to do this without impacting profitability. Organizations that can turn such investments into market advantage will reap the benefits. The third challenge is addressing the requirements of efficiency, growth and resiliency to provide more relevant, robust, timely, and cost effective information to business decision makers. Customer retention is important in a volatile market so attention must also be paid to enhancing the customer experience.

Strategic Risk Management

Within the financial markets industry, organizations are moving quickly to improve risk management capabilities in order to gain transparency into their investments, comply with regulations, and reveal unknown exposures. Risk management is vital to the success of an organization and the confidence, accuracy and timeliness of the firm's enterprise-level risk reporting, will have a direct impact on their bottom-line. Risk management is a complex area looking at many factors of the overall risk formula, such as, credit, liquidity, interest rate, counterparty and market risks. Taking a more proactive, enterprise-wide approach to managing compliance issues requires organizations to leverage compliance and risk management in a way that creates new value for the business through greater transparency, better leveraged capital and increased trust. Greater transparency will be critical, not only because regulators and customers are demanding it, but also because of the emergence of collaborative business models and partnerships. Risk management and regulatory compliance require fast, accurate and complete data. The key for financial institutions is to leverage compliance investments enterprise-wide by shifting the focus from implementing best-of-breed controls that solve specific problems to facilitating a decision-driven approach that helps the company grow revenue and profits, and manage the business more effectively.

It is no surprise that risk management is tightly coupled with regulatory compliance. For eExample, Dodd-Frank is focused on the areas of Swap-Data Reporting, Retail-Forex, Capital Rules and the Volcker Rule. These are all factors or areas that any viable risk management solution would need to track and analyze. IBM can help financial institutions tackle both ends of the risk equation by going beyond regulatory and compliance requirements to take a strategic approach to risk. Today's firms are being challenged to improve corporate decision making, optimize economic capital allocations and strengthen corporate control, resilience and compliance by facilitating the effective management, monitoring and control of risk. There has been a dramatic increase in focus on risk oversight and adopting a proactive risk approach. Research conducted by the IBM Institute for Business Value shows that CROs state that their most important tasks are to develop policies and procedures, monitor risk and, critically, develop an Enterprise Risk Management culture. IBM can help clients execute faster and with increased reliability in this dynamic marketplace.

Regulatory Compliance

The financial services industry has seen many events over the last 100 years that have shaken the industry to its core. For example,

- 1995 - Barings Bank Collapse
- 2001 - Enron Declared Bankrupt
- 2002 - Worldcom Fraud
- 2002 - Allfirst Fraud
- 2008 Bernie Madoff Fraud
- 2008 - 2012 - EU Country Bailouts

All these events have triggered responses from government and the industry itself, from the setup of the Securities and Exchange Commission to the Bank of International Settlements defining the Basel II standards. All these events have been met with regulation and this means organizations need to adhere to these regulations if they want to stay in existence. Over the last few years the industry has seen a large amount of regulation and standards:

- Basel II
- Basel III
- Capital Requirements Directive
- Dodd-Frank
- Foreign Account Tax Compliant Act
- Markets in Financial Instruments Directive (MiFID)
- Sarbanes Oxley
- US Patriot Act

If an organization does not have a good information program, they may struggle to comply with the various regulations they must adhere to. This will inevitably lead to fines from the regulatory body and could restrict their ability to do business. Regulation has been among TowerGroup's Top 10 business drivers in securities and capital markets for the past few years and will likely remain so in perpetuity. It will most likely remain the most significant driver through at least 2013. The overlap between risk management and regulation continues since risk management techniques will be driven in part by regulation.

Data Consistency/Data Governance

All too often, information is inconsistent, out-of-date, incomplete or simply not available when and where it is needed most. The effects of such information misalignment can be felt throughout the organization in rising costs, inefficiencies, and missed opportunities. A lack of trusted information can result in even more significant consequences when new products or business models executed on the basis of faulty information result in costly failures.

Ten common signs of a poor information infrastructure:

1. No single enterprise view of data
2. Senior management requests for information require intensive manual effort and take too long to respond to
3. Low return on technology investments and high operational costs.
4. Multiple databases or spreadsheets storing similar data with no common data "dictionary" across the enterprise.
5. No ownership of data.
6. Difficulty complying with regulatory requirements, such as Basel II, Dodd-Frank, etc.

7 Senior management questioning the quality, timeliness, or reliability of information used to make multi-million-dollar decisions.
8 Difficulty answering questions about the origins of and business processes performed against data.
9 Inability to keep up with the volume, pace, and variety of data.
10 Need for extensive manual effort to understand source information

Addressing these three major challenges requires the organization to be able to leverage their information as a strategic asset to provide competitive differentiation. With a little care, solutions to help identify and manage risk can also be extended to support compliance reporting whilst supporting business decision making in a cost effective manner.

What is IBM Financial Markets Data Warehouse?

IBM Financial Markets Data Warehouse is a data warehouse and data mart design blueprint that accelerates the development of Business Intelligence (BI) solutions for the financial markets industry. IBM Financial Markets Data Warehouse contains business and design models that accelerate the gathering of business requirements, defining the important business terms and designing the supporting logical and physical data structures.

IBM Financial Markets Data Warehouse:

- Includes ready-to-use Analytical Requirements, business vocabulary and enterprise data warehouse and dimensional designs that can be implemented selectively or as a whole.
- Embodies requirements from the MiFID such as the categorization of counterparties as retail or professional.
- Delivers extensive coverage and reporting templates for Basel II/III, SOX, Integrated & Systemic Risk, Wealth and Investment Management.
- Supports analysis of financial transactions providing a single view of trades and associated reference data across the front and back offices. This covers topics such as position and exposure analysis, Volume Weighted Average Price (VWAP) analysis and reporting on best execution.
- Contains integrated data model support for clients wishing to implement an atomic data warehouse.
- Contains dimensional model support for clients wishing to implement a dimensional warehouse.

IBM industry models can be used in conjunction with IBM software products, thereby facilitating transformation to an On Demand Business from requirements gathering, analysis and design through to deployment.

Using IBM Information Management Software

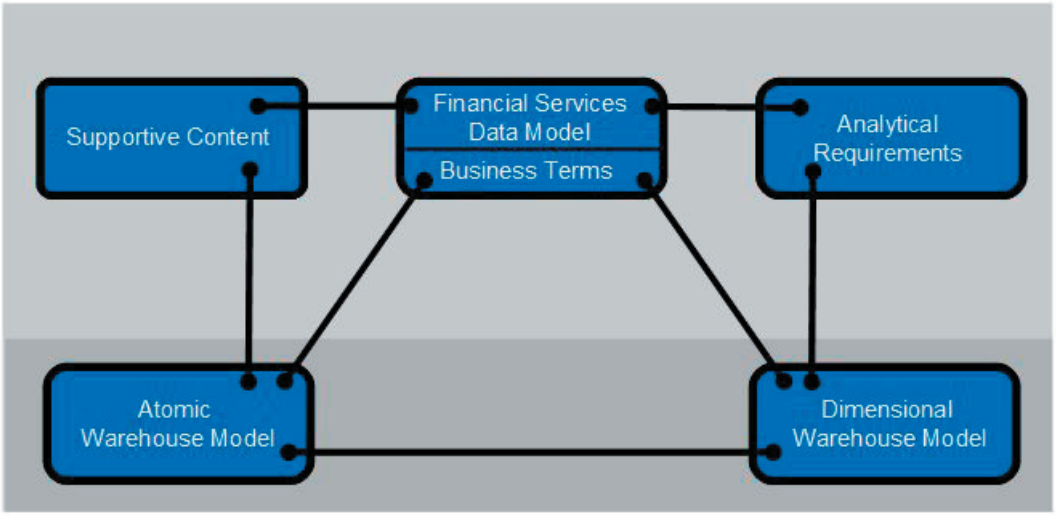
The tight integration between the IBM Industry Data Models, InfoSphere Business Gloassary, InfoSphere Data Architect (IDA) and IBM InfoSphere Information Server (IIS) allows organizations to exploit industry-specific business and technical metadata to accelerate data integration projects such as master data management initiatives or data warehouse development. For example, IBM Industry Data Models and IDA physical schemas can be shared across the entire IIS platform, including InfoSphere Information Analyzer, InfoSphere FastTrack, InfoSphere DataStage® and InfoSphere QualityStage®. In addition, business or glossary definitions from IBM Industry Data Models and IDA can be used to populate an InfoSphere Business Glossary to share common definitions across the enterprise.

Benefits of using the Financial Markets Data Warehouse

IBM industry models typically support approximately 80% of business requirements and can be easily customized and extended to cover the specific requirements of a financial institution. They assist a financial institution in implementing a flexible, reusable, extensible and easily customizable architecture, which enables organizations to:

- Increase adaptivity and faster response to changing customer needs
- Accelerated Time to Value in the modeling, design and deployment phase of a project
- Proven design templates reduce project time and costs
- Improve Operational Efficiency and Effectiveness
- Strengthen Business/Technology Linkage
- Focus on achieving competitive differentiation
- Identify and leverage best-practice behaviors across the organization

IBM Financial Markets Data Warehouse



IBM Financial Markets Data Warehouse comprises interconnected models and supporting tooling that accelerate the design of an enterprise data warehouse business intelligence (BI) solution driven by financial-services-centered business requirements. 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.

The IBM solution architecture comprises:

- **Financial Services Data Model (FSDM) & Business Terms**
  The vocabulary of the business can be represented either in a structured format (the Financial Services Data Model) or in a plain business language format (the Business Terms)
- **Atomic and Dimensional Models**
  Comprehensive logical data models containing the predefined data warehouse structures required to store all financial services data in an efficient layout.
- **Supportive Content**
  Capture non-reporting requirements in a particular domain and relate those to the data warehouse model entities, relationships and attributes. Project scopes that define a business issue in terms of a set of items within a data warehouse project..
- **Analytical Requirements**
  Reporting requirement specifications providing subject-oriented definitions of the reporting and analysis requirements of an organization. Over 140 predefined business reporting requirements templates addressing the common business reporting and analysis requests from risk, finance, compliance, CRM and line-of-business users.

Financial Services Warehousing

Enabling organizations to build data warehouse solutions to suit their specific needs, The data warehouse has the flexibility to create a range of data warehouse solutions from departmental data marts to enterprise-wide data warehouses, while including the key components required for the core of a data warehousing solution. The data warehousecontent models are the cornerstone components of an organization's customized development of a data warehouse and BI environment. The data warehouse consists of more than 140 predefined Analytical Requirements that support the rapid definition, scoping and development of commonly required data warehouse reporting and analysis requirements such as Customer Profitability, Wallet Share Analysis, Customer Attrition Analysis and Liquidity Analysis.

The data warehouse also comprises a proven, flexible and scalable data-warehouse-technical infrastructure, enabling organizations to build comprehensive data warehouse solutions with a view to delivering business value rapidly without compromising on scalable, technical data warehouse infrastructure. Organizations using the data warehouse to address their Basel II requirements or evolving their current risk management and reporting capability to a higher level of maturity build on a proven foundation that addresses these specific requirements.

The data warehouse covers the following areas:

- **Asset and Liability Management -** Maximizes long-term wealth for an Involved Party.
- **Investment Management -** Emphasizes custody, cash management, performance and attribution, fund accounting and corporate governance.
- **Regulatory Compliance -** A separate category to support regulatory reporting and AML.
- **Risk Management -** Focuses on the impact of potential changes in the organization's business. Extensive work has been done to support the Pillar 3 reporting requirements of Basel II and the implied reporting and analysis requirements of Pillar 2.
- **Wealth Management -** Emphasizes portfolio management, relationship management, performance reporting and financial planning.

Differentiation

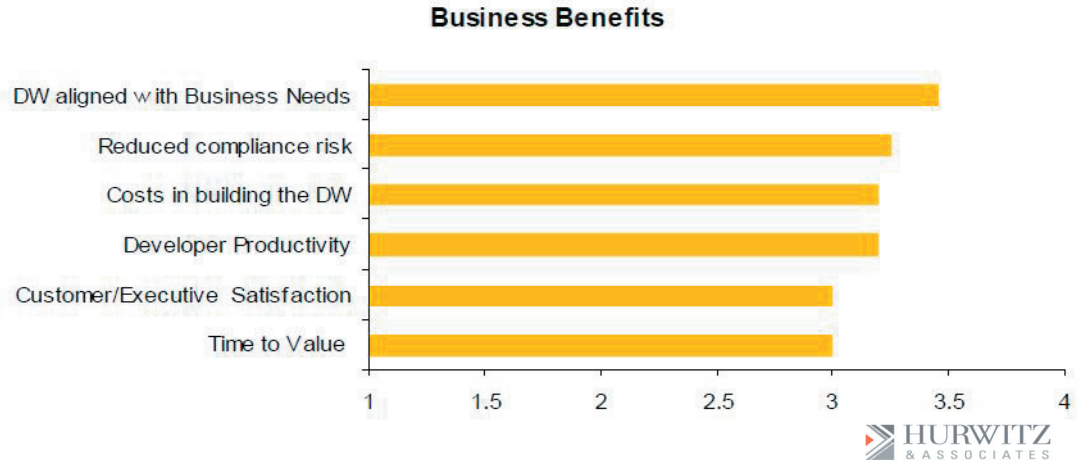
- **Business Ready**
  The models are proven to foster collaboration and approval between business and IT to turn business requirements into actionable solutions.
- **Regulation Aware**
  Subject matter experts have distilled compliance regulations into statutory reporting requirements without the need for external development.
- **Comprehensive**
  Content from multiple client engagements is turned into interrelated data models with a proven methodology.

Benefits

- Encapsulates IBM's extensive experience in delivering effective data warehouse solutions to some of the world's leading financial services organizations.
- Delivers competitive advantage by providing consolidated and clean data.
- Supports rapid implementation of warehousing solutions with meaningful financial data.
- Provides a combination of sound infrastructural techniques, a proven data management product set and rich functional content.
- Facilitates the subsequent customization and extension of the data warehouse
- Enables business users to control more effectively the definition and scoping of the data warehouse solution
- Reduces development cost
- Reduces risk by taking an incremental approach to delivering integrated management information

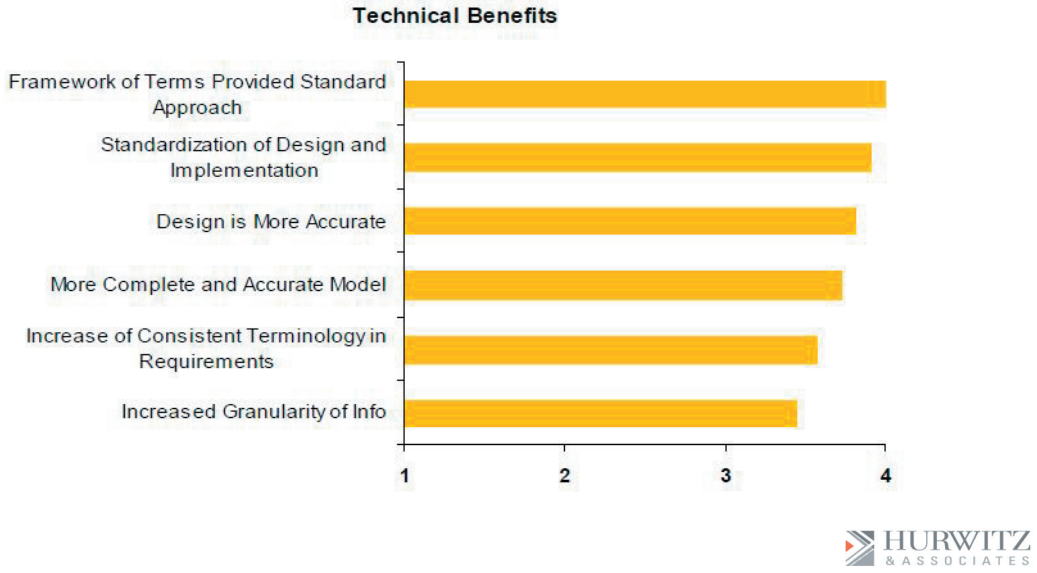
Project Cost Reduction

- 30 to 40% time savings in modeling
- 20 to 25% time savings in design
- 15% time savings in deployment
- 10 to 15% cost savings to build warehouse



User-reported benefits

- Reduced compliance risk
- Data warehouse cost reduction
- Customer satisfaction
- Time to value



Enterprise-wide Data View

IBM Financial Services Data Model provides a common, enterprise-wide understanding of the vocabulary of the financial services industry. It is a classification model that describes business concepts in a top-down manner, from the most abstract to the most specific. As a generic model that defines data widely applicable to financial services organizations, it provides organizations with a jump start in the model development process and maximizes the value of information. The information reflected in the data model is independent of organizational structure and has been validated by multiple sources within the industry.

IBM Financial Services Data Model is a business model that:

- Merges requirements of existing models.
- Provides stability, flexibility and reusability.
- Incorporates classification, inheritance, object state behavior and other concepts of object-oriented design.

IBM Financial Services Data Model is data-centered and represents the business information requirements of a generic financial services organization, along with the necessary rules to assure information integrity. The model provides a framework for the development of consistent, cross-enterprise data structures that promote information sharing across business applications. Providing a top-down view from an enterprise perspective, it is a blueprint for database development as well as a tool for understanding and communicating the enterprise information resources of the major business activities of financial services organizations.

IBM Financial Services Data Model enables users to:

- Agree on the scope of an initiative or application
- Manage the enterprise data resource
- Managing the enterprise component architecture
- Carry out impact analysis
- Derive logical specifications
- Plan data warehouse design
- Structure business concepts

Benefits

- Provides a structured starting point to integrate data and process.
- Provides a rigorous specification of data requirements, reducing redundancy of information across the enterprise.
- Provides common definitions for improved data accuracy and consistency.
- Facilitates the application development life cycle, thereby reducing system and lost-opportunity cost.
- Provides a consistent data architecture for modeling new or changed requirements.
- Creates a customizable model incorporating the organization's data requirements and business rules.
- Focuses development effort on validating, enhancing and extending data requirements rather than devoting time to the labor-intensive process of developing a data model for the services organization.
- Provides business terms, definitions and relationships for populating a business glossary.

Data Concepts

IBM Financial Services Data Model comprises over 7,400 business definitions, grouped into nine conceptual categories. It represents the business information needs and requirements of the financial services organization using common terms understood by business professionals. It identifies high-level data concepts, defines the scope of the enterprise and provides the model content framework.

It contains business definitions of the data items that are important and common to the organization. These definitions are organized for detailed modeling and structured to be independent of application requirements. This layer identifies:

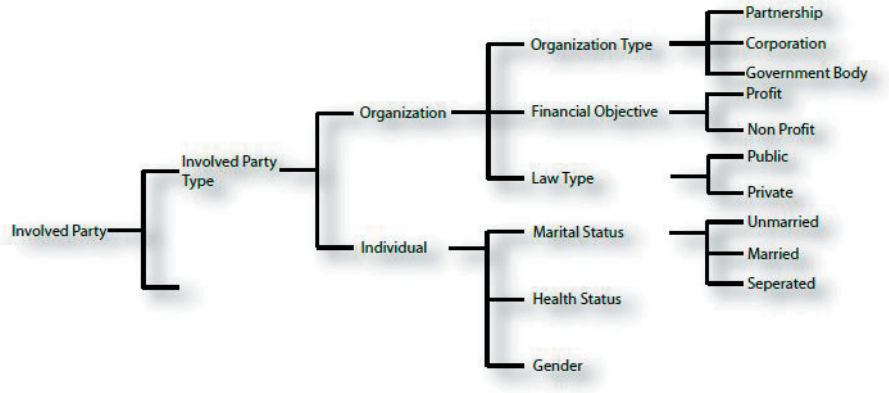
- Data item classes
- Data entities
- Relationships between data entities
- Generic inheritance structure

The data items are categorized in nine data concepts:

Arrangement	Represents a potential or actual agreement between two or more individuals, organizations or organization units, providing and affirming the rules and obligations associated with the sale, exchange or provision of goods, services and resources.
Business Direction Item	Records an expression of an Involved Party's intent with regard to the manner and environments in which it wishes to carry out its business.
Condition	Describes the specific requirements that relate to how the business of an organization is conducted, and includes information such as prerequisite or qualification criteria and restrictions or limits associated with these requirements. Conditions can apply to various aspects of an organization's operations: • Product sale and servicing • Determine eligibility to purchase a product • Assign specific general ledger accounts appropriate for different business transactions • Required file retention periods for various information types • Selection criteria for a market segment
Classification	Organizes and manages business information by defining structures that provide classification categories applying to one or more data concepts and groups of business concepts that apply to multiple data concepts.
Event	Describes a happening about which the organization wishes to keep information as part of carrying out its mission and conducting its business.
Involved Party	Represents all participants that have contact with the organization or that are of interest to the organization, and about which the organization wishes to maintain information. This includes information about the organization itself.
Location	Describes a place, a destination of information or a bounded area, such as a country or state, about which the organization wishes to keep information.

Product	Describes goods and services that can be offered, sold or purchased by the organization, its competitors and other Involved Parties during the normal course of business. Product also includes non-financial goods and services that are of interest to the organization.
Resource Item	Tangible or intangible value items that are owned, managed, used by or of specific interest to the organization in pursuit and accomplishment of its business.

The emphasis of the business requirements level is on identifying and defining the business information needed to support the enterprise in terms used and understood by business professionals, rather than information system professionals. IBM Financial Services Data Model organizes the data items supported by each business definition and identifies potential subtypes of the data concepts, fundamental property types and relationships. The fundamental information requirements are structured into data concept hierarchies, using principles of classification theory. Each data concept has schemes and values. The schemes correspond to the criteria or questions that you can apply to instances of the data concept, while the values are the answers to the questions.



Sample FSDM hierarchy

Features

Financial Services Data Model is a cross-enterprise model of the business requirements of a global, generic services organization in the financial services industry. The key features are:

- Layered model with sufficient detail to represent the data requirements of a universal financial services organization operating in an international environment
- Advanced modeling techniques to encourage reusability of system assets
- Composite data model for system requirements
- Flexibility in extension and expansion
- A platform for improved data management and systems development
- Direct benefit in all phases of the systems development life cycle

IBM Financial Services Data Model has been developed with the assistance of banking professionals to facilitate understanding and navigation of the model by those who may have had minimal exposure to data modeling. At the same time, the structure and rigor of IBM Financial Services Data Model satisfies the needs of analysts. It provides a communication bridge between the banking and information systems professionals within the organization.

Business Terms

Business Terms can be used in place of the FSDM, depending on implementation technology. They define industry concepts in plain business language, with no modeling or abstraction involved. Business terms have a set of properties and are organized by business category. Clearly defined business terms help standardization and communication within a company.

Mappings to the data models make it possible to create a common, enterprise-wide picture of the data requirements and to transform these requirements into IT data structures.

Business terms define key business information used for business operations and analysis, enabling users to understand information used by IT assets by allowing traceability between business terms and IT assets. As a consequence, developed IT solutions are driven by business requirements.

Business terms should exclude terms that are not meaningful to a business user, such as terms that are too abstract. Business terms do not model data requirements but capture the data requirements in a simple and flat structure. The modeling activity happens next in the data models when the business terms are modeled using modeling artifacts such as inheritance, relationships and attributes. Business terms must be traceable to IT assets, but all artifacts defined in an IT asset do not have to be traced back to a business term.

- **Business Term Properties**
  Business terms are defined by properties that describe in business language the meaning of the business term and its status, organized in business categories defined below the business terms category.
- **Business Category Properties**
  A high-level business area that helps to organize business terms, business categories describe in business language the meaning of the business category. Business categories are defined below the business terms category and provide a navigation tree for browsing business terms.

Atomic Warehouse Model

The Atomic Warehouse Model is an Entity Relationship data model that provides the historical and atomic data needed for a data warehouse and BI infrastructure supporting multiple lines of business and analytical functions within medium-to-large organizations. The aim of this shared infrastructure is to provide a reusable platform and data structure environment that reduces the development and operational cost in providing BI functionality to a myriad of front and back-office organization units.

The Atomic Warehouse Model provides the infrastructure to support the provision of clean, rationalized and easily accessible data from a central information repository, while allowing organizations to exploit the potential of information previously locked in legacy systems inaccessible to the business user. It enables organizations to address the infrastructure and storage issues for multiple compliance requirements from a single blueprint.

A logical model is a representation of an organization's data or information requirements represented in an Entity Relationship Diagram (ERD), with each model element having its own entity. It represents the organization's data, without constraint consideration or implications in connection with platform, tools, software or how the data can be implemented. It is normally generic and flexible in design, enabling organizations to understand its data and how this data relates to other data within the organization.

The atomic warehouse model features a flexible System of Record (primary data storage area) as well as the typical summaries needed by most financial services organizations, and is expressed as a logical model with an emphasis on capturing business objects and their relationships to other objects. This logical model can easily be transformed into a database-ready, deployable model known as a physical model. Normally, only a portion of the atomic warehouse model is

generated in the initial project phase. Over time, further areas can be generated as the organization tackles more business areas. With over 1,260 entities and over 7,770 attributes, The data warehouse model handles the storage of raw detailed data from many sources and has predefined aggregation to support key indicators in areas such as profitability.

This comprehensive data model is derived from IBM Financial Services Data Model (FSDM), and can be used as the basis for supporting a detailed analysis of the areas of most concern to bankers today:

- Consistent definition of customer and products across the organization
- Customer loyalty and retention
- Enterprise-wide risk management
- Householding
- Identification of purchasing and product usage patterns
- Improvement of cross-selling ratios
- Marketing campaign management
- Maximization of wallet share
- Profitability and performance of customers, products and channels
- Relationship management

The atomic warehouse model supports the typical data warehouse business requirements of financial services organizations and supports the same business areas as Analytical Requirements.

The atomic warehouse model can be used as:

- The blueprint for designing a central business data warehouse database structure. The data warehouse model enables you to create a flexible,extendible and data-warehouse-specific physical database.
- A logical reference point for the consolidation of data definitions and structures across a number of data marts.
- A starter set for data mart design, where the structure needs to be optimized for the performance of end-user delivery functions.

Major Groupings within the Atomic Warehouse Model

The atomic warehouse model has major groupings based on the intended usage of items within a data warehouse environment:

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- Summary Area
- System of Record

Summary Area

Contains and describes summaries and aggregations commonly and frequently used throughout the organization. These summary entities are often populated from the System of Record. Creating and maintaining such summaries in a data warehouse standardizes such summaries across the organization. These summary entities store key measurements and indicators on a periodic (typically monthly or quarterly) basis.

Accounting Unit Summary	Holds the periodic summarizations related to Accounting Unit. The Accounting Unit is the basic mechanism used for holding numerical data within the Banking Data Warehouse. The Accounting Unit Summary entity enables the capturing of the Accounting Unit information on a periodic basis, for example the quarterly credit and debit balances for a particular segment of the Customer base.

Arrangement Summary	Holds the periodic summarizations related to Arrangement. The Arrangement forms one of the basic foundations of the Banking Data Warehouse Model. This makes it a very suitable place to position many of the typical summary tables. Once the summary is done at the Arrangement level it is then possible to roll-up these summaries into dimensions such as Involved Party, Organization Unit, Product, Channel, etc.
Budget Profile	Holds entities relating to budgeting.
Group Summary	Holds the periodic summarizations related to Groups.
Involved Party Summary	Holds the periodic summarizations related to Involved Party. Some of the subtypes of Involved Party would typically require periodic summaries. Typically such summaries are required for Customer and Organization Unit. The purpose of such summaries is to record key indicators for the relevant item.
Operational Risk Management	Specifies the information required for the Management of operational risk of a Financial Institution.
Product Summary	Holds the periodic summarizations related to Product. It is important for Financial Institutions to measure the effectiveness of their Products in terms of profitability, usage, etc. The Product Summary entities in this Subject Area provide the mechanisms to do this task.

System of Record

The primary storage area for the data in the data warehouse, this component is populated by data coming from the operational systems. The data structures in the System of Record are generalized and a large proportion of data warehouse model fits into this component.

Accounting Unit	Monitors both monetary and non-monetary standings. An Accounting Unit may be used to support the operation of an Arrangement, or it may be used by the Financial Institution to facilitate myriad internal requirements to record and monitor quantitative change. Typically, for an Arrangement, an Organization Unit, a Campaign, etc. many quantities are tracked together. For example, the collected balance, interest income, direct and indirect costs and derogated fees would be among the quantities tracked for an individual loan. Likewise, cost of investment, realized market gain, unrealized market gain, and transaction costs would be among the quantities tracked for a securities investment. Promotion costs, number of targets, volume of business gained, would be among the quantities tracked for a sales campaign. In each case the various quantities all refer to a common point of reference, such as the loan, the securities investment, or the sale's campaign. This common point of reference is modeled in the BDW as the Accounting Unit. Accounting Structure defines the Chart of Account(s) used to define the Categorization of Accounting Units. Accounting Structure is used to store accounting structures for use in General Ledger Accounts and, when required, Managerial Accounting Units. The Accounting Unit and consequently the Accounting Unit Balance structures, as logically modeled for the Banking Data Warehouse, are generic atomic structures. Only one balance is recorded on the Accounting Unit Balance in a Data Warehouse context; given considerations of volumes, population and retrieval.
Activity Based Costing	Contains the various entities involved in the support of Activity Based Costing. The purpose of Activity Based Costing is to enable the assignment of costs to the activities of the Financial Institution, and to then allocate those costs out to the various agencies within the Financial Institution that can be considered to be responsible for generating them. In this way, a better image of profitability can be obtained. Costs (and Financial Institution income) can be assigned to Activities of a given Type occurring on a given Channel. In addition, any Involved Party can have a role of being an Allocation Center. Configuration tables are provided to define the percentage distribution of the costs (and incomes) of occurring Activities, according to the role the Involved Party has in relation to the Customer performing the Activity e.g. the Organization Unit that owns the Customer. A Transaction Allocated entity records the actual amounts allocated, and an Allocation Center Summary summarizes the allocations by Measurement Period.
Arrangement	Records any legally binding agreement between two or more Involved Parties. Arrangements can be for Customer Services, recording agreements between co-operating Banks, Employment terms, etc. Examples of Arrangements are : Employment Arrangements Product Arrangements (Loan Arrangements, Deposit Arrangements etc.) Interbank Agreements Security Arrangements.
Asset Securitization	Contains the various entities involved in the support of Asset Securitizations.
Classification	Represents a common collection point for simple sets of codes that are used to classify or codify some facet of the business. For example, there are a set of codes representing Involved Party Types - these are stored in the Classification structure; there are a set of classifications representing Individual Marital Status Types - these too are stored in the Classification structure. Classifications are composed of a Classification Scheme and a Classification Value. In the latter example 'Individual Marital Status Type' is the scheme while the values are codes representing 'Single', 'Married', 'Separated', 'Divorced', etc. The Focal entity of this Subject Area is Classification.

Communication	Records an exchange of information with an Involved Party; for example, receive Customer's request for an interim statement, (USA) transmit a report on liquidity levels to the Federal Reserve. The Focal entity of this Subject Area is Communication.
Condition	Describes the specific requirements that pertain to how the business of a financial institution is conducted and includes information such as prerequisite or qualification criteria and restrictions or limits associated with these requirements. Conditions can apply to various aspects of a financial institution's operations, such as the sale and servicing of products, the determination of eligibility to purchase a product, the authority to perform business transactions, the assignment of specific general ledger accounts appropriate for different business transactions, the required file retention periods for various types of information and the selection criteria for a market segment.
Credit Risk Mitigation	A Subject Area which contains the entities related to all aspects of the Financial Institutions Credit Risk Mitigation activity.
Event	Describes a happening about which the Financial Institution wishes to keep information as a part of carrying out its mission and conducting its business.
Financial Market Position	Shows the position entities required to support the Financial Market trading, settlement and investment functions.
Housekeeping And Characteristics	Contains Housekeeping and Characteristic entities. Housekeeping entities represent information that is either static, or only changes slowly over time e.g. lists of countries, currencies, languages, etc. The data in Housekeeping entities is often obtained from official sources outside of the Financial Institution, and the content of that data is usually outside the control of the Financial Institution. Characteristic entities are purely logical constructs used to control and identify sets of common attributes which are required to appear on multiple entities throughout the warehouse. For example, the Summary Currency Characteristic ensures that for each Summary entity, an identical set of attributes representing the Original and Measurement Currencies and the Exchange Rate between them appears on each Summary. By altering the Characteristic contents, all targeted entities can be immediately updated with a new and identical set of attributes.
Insurance	Contains the various entities involved in the support of Insurance.
Involved Party	Persons or organized groups of persons about whom the Financial Institution wants to keep information. Involved Party includes Individuals, Organizations, Grouped Individuals, Organization Units, and Employment Positions.
Islamic Banking Fundamentals	Contains elements specific to Islamic Banking. Islamic Banking refers to a system of banking or banking activity that is consistent with the principles of Islamic law. Islamic Banking prohibits the payment or acceptance of interest fees for loans of money (Riba, usury), for specific terms, as well as investing in businesses that provide goods or services considered contrary to its principles (Haraam, forbidden).
Limit	Identifies restrictions that can be defined between entities. These are generally defined at a generic level as limits on the relationships between objects - for example, maximum over night limits imposed on a dealer for a Trading Arrangement are recorded using the Arrangement/Involved Party Relationship Limit. The Subject Area also tracks changes to these limits, which record the history of each change to the limit over time. In addition, special structures exist to support the limits that are intrinsic to the operation of Credit Facility Arrangements, and general limits for Arrangements can be tracked using the Arrangement / Limit Type Rltnp associative (e.g. Maximum Per Person Benefit on a Travel Insurance Arrangement).
Location	Stores the physical or logical locations used by the Financial Institution and by Customers. Examples of Addresses are: 2 Burlington Road, Dublin 4, Republic of Ireland; 555 Main Street, Boise, Idaho; www.ibm.com/solutions.
Netting	Contains Netting and its related entities. Netting set means a group of transactions with a single counterparty that are subject to a qualifying master netting agreement or qualifying cross-product master netting agreement.
Product	Describes goods and services that can be offered, sold or purchased by the Financial Institution, its competitors and other Involved Parties during the normal course of business. Product also includes non-financial goods and services that are of interest to the Financial Institution.
Resource Item	Includes and describes any value item, either tangible or intangible, that is owned, managed, used by, or of specific interest to the Financial Institution in pursuit and accomplishment of its business.
Wealth Management	Contains those entities required to provide enhanced support, over and above the standard Financial Services entities, for Wealth Management.

Dimensional Warehouse Model

As the enterprise-wide repository for analytical data, the Dimensional Warehouse Model contains star-schema-style dimensional data structures organized around fact entities that support Analytical Requirements. Accessed directly through analytical tools or queries, its content can be easily distributed to specific downstream data marts. Dimensional Warehouse Model content is derived from the atomic data represented in The data warehouse model and includes entities for efficiency of storage and analysis such as Mini-dimension entities. The Dimensional Warehouse Model is delivered and customized as a logical data model.

The data warehouse model and the Dimensional Warehouse Model cover the warehousing capability at enterprise level. Dimensions in the Dimensional Warehouse Model are driven by dimensional star-schema modeling, without the same focus on atomic and normalized data as in the data warehouse model. Both models complement each other and can be deployed together or separately.

Dimensional Warehouse Model Principles

Conformed Dimensions	A master dimension for which content has been agreed by all parties in the enterprise that allows reusable aggregation paths for measures across multiple fact tables, and are represented as Dimension Entities in the Dimensional Warehouse Model.
Conformed Facts	A measure for which a business definition has been agreed by all parties in the enterprise, so the fact can be used in analytic computations across separate data sources and with other conformed facts. Conformed Facts are represented as fact entities in the Dimensional Warehouse Model.

These design principles define consistency across fact tables, improve the quality of analytical results and facilitate analysis techniques, such as drilling across. The population of fact tables in the Dimensional Warehouse Model allows a single calculation of measures, which can then be distributed in a consistent way to multiple downstream data marts. As opposed to independent data marts that are not populated from a single source of analytical data, the Dimensional Warehouse Model provides “a single version of the truth”. The Dimensional Warehouse Model is partly denormalized to achieve the star schema objective.

Dimensional Warehouse Model Elements

Package	A grouping of Dimensional Warehouse Model elements for organizational purposes. Packages partition elements by grouping them according to business opportunities. Packages are based on the Focus Areas, which structure Analytical Requirements. This Package construct is not available in ERwin.
Dimension Entity	Descriptive information about the numerical values in a fact entity. A typical dimension entity is the Time dimension, which indicates the time value of a particular fact. In the Dimensional Warehouse Model, dimension entities are used in a star-schema style. Dimensions entities originate from the Business Terms defined as dimensions in Analytical Requirements and from the fundamental entities in the data warehouse model. A dimension entity comprises elements of a fundamental entity and elements from other fundamental entities that together form an aggregation path.
Fact Entity	Groups a set of measures (facts) that share the same dimensions. The measures in the fact tables support the measures defined in Analytical Requirements. The fact entity is the core entity of a dimensional data structure. All or a subset of the measures and dimensions that are held in a fact entity can be distributed to one or more downstream data marts.
Relationship	Links a fact entity (child) with its dimension entities (parents), and is labeled with a business-meaningful name originating from the business term used as dimension in an Analytical Requirement.

Attribute	A single information concept that describes a dimensional entity or a fact entity.
Data Domain	Defines the type of data value held by an attribute in a data model. This can be an atomic domain such as String or Number, a List domain, which defines a list of allowed values, such as Gender or Color. IBM Industry Models are delivered with predefined data domains.
Diagram	A graphical representation of Dimensional Warehouse Model elements and their relationships, showing how model elements relate to each other. Diagrams are also used to represent the Dimensional Warehouse Model elements belonging to a project scope. In ERwin, the diagram construct is supported by a subject area.

Supportive Content

Supportive Content is a method of mapping external business standards terms to the Business Terms component. This helps business users understand how external business terms are representing in the models. For example, requirements such as Basel II and International Financial Reporting Standards (IFRS) can be represented by structured groupings of data elements, such as Loss Given Default (LGD). 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 warehouse model.

A key differentiator between Analytical Requirements and Supportive Content is that Supportive Content are less structured (not defined as measures and dimensions, but simply as data elements presented in logical groupings), while Analytical Requirements describe reporting elements. Examples of the use of such grouping of data elements include data mining, credit risk calculators, credit scoring and balanced scorecard whose data requirements can be supported by the Supportive Content as a mechanism for both documenting the requirements and understanding how those data requirements are supported by the data warehouse model.

The purpose of Supportive Content is to capture requirements in a particular domain of interest and then relate Supportive Content to the data warehouse model entities, relationships and attributes that support those requirements. To this end, Supportive Content is defined in the language of the users of the given application. As with usage of Analytical Requirements, the user scopes out the requirements using Supportive Content, which automatically select the most appropriate data warehouse structures using the the data warehouse model mappings.

The internal-ratings-based (IRB) approach uses risk metrics in order to calculate the required Risk Weighted Asset values. Supportive Content for Basel II is organized in the same way for ease of identifying the risk elements required and the underlying data structures in the warehouse to support them.

Supportive Content Coverage

Basel Framework

Capital Adequacy & Capital Ratio	Capital Adequacy Framework Final Rule
Credit Risk - Standardized	Effective Maturity (M)
Expected Loss (EL) And Provisions	Exposure At Default (EAD)
Liquidity Risk Management	Loss Given Default (LGD)
Market Risk - Incremental Risk Charge (IRC)	Market Risk - Internal Model
Market Risk - Standardized	Operational Risk
Probability Of Default (PD)	Securitization Framework

The First Pillar - Minimum Capital Requirements	Market Risk Capital Requirement
Credit Risk - Internal Ratings Based (IRB)	Systemic Risk
Concentration Risk	Stress Testing & Scenario Analysis
Counterparty Credit Risk	Global Capital Framework

Dodd Frank

Swap Data Reporting Requirements	Legal Entity Identifier LEI
Retail Foreign Exchange Transactions	

FATCA

FATCA US Taxpayer Compliance	FATCA Foreign Financial Institution Compliance

SEPA

Bank to Bank Space - Supportive Content containing the data items required for the Direct Debit Rulebook DS-04 Direct Debit Collection and the Credit Transfer Rulebook DS-02 Interbank Payment Dataset.
Bank to Customer Space - Suppotive Content containing the data items required for the Direct Debit Rulebook DS-06 Customer to Bank Direct Debit Collection Credit Transfer Rulebook DS-04 C2B Information.
Customer to Bank Space - Supportive Content containing the data items required for the Direct Debit Rulebook DS-03 Customer to Bank Direct Debit Collection and the Credit Transfer Rulebook DS-01 C2B Information.
Reversal Events - Supportive Content containing the data items required for the Direct Debit Rulebook DS-07 Interbank Reversal Instruction for the Collection by the Creditor (there are no attributes listed for Credit Transfer Rulebook).
Status/Reject/Return Events - Supportive Content containing the data items required for the Direct Debit Rulebook DS-05 Reject, Return or Refund of a Collection or a Reversal Credit Transfer Rulebook DS-03 Reject or Return.

IFRS

Income statement, by function of expense - Consolidated financial statements
Income statement, by function of expense - Separate financial statements
Income statement, by nature of expense - Consolidated financial statements
Income statement, by nature of expense - Separate financial statements
Statement of cash flows, direct method - Consolidated financial statements
Statement of cash flows, direct method - Separate financial statements
Statement of cash flows, indirect method - Consolidated financial statements
Statement of cash flows, indirect method - Separate financial statements
Statement of comprehensive income - Consolidated financial statements
Statement of changes in equity - Consolidated financial statements
Statement of changes in equity - Separate financial statements
Statement of changes in equity [alternative] - Consolidated financial statements
Statement of changes in equity [alternative] - Separate financial statements
Statement of comprehensive income - Separate financial statements
Statement of comprehensive income [alternative] - Consolidated financial statements
Statement of comprehensive income [alternative] - Separate financial statements
Statement of financial position, current/non-current - Consolidated financial statements
Statement of financial position, current/non-current - Separate financial statements
Statement of financial position, order of liquidity - Consolidated financial statements
Statement of financial position, order of liquidity - Separate financial statements

Financial Markets

FpML Definitions	Bond
Bond Future	Equity Option Trade
Foreign Exchange (Fx)	Term Deposit
Forward Rate Agreement	Cross Currency Swap

International Accounting Standards

IAS Accounting Structure	IAS Book Value
Retained Earnings	Cash Flow Hedge Evaluation
Revaluation Reserve	Yield Interest Income
Agio Amortization Interest Expense	Total Interest
Held For Trading Instrument Profit	Held For Trading Instrument Loss
Other Financial Instrument Profit	Other Financial Instrument Loss
Unrealized Fair Value Hedge Profit	Unrealized Fair Value Hedge Loss
Financial Instrument Maturity	

Securities and Exchange Commission (SEC) US Generally Accepted Accounting Principles (GAAP) support

The SEC is an independent federal agency that oversees the exchange of securities to protect investors. The US GAAP are the standard framework of guidelines for financial accounting.

Other

Enterprise Payments Platform - Supportive Content containing the data items required for Enterprise Payments Platform (EPP) support. EPP is a service-based, payments business architecture underpinned by a technology framework capable of supporting IBM and third-party payment products, as well as bank-developed payment services. Leveraging IBM's history of developing transactional and payment products, this framework provides the core integration and transaction management functionality required to support enterprise payment processing and product development.

MISMO eMortgage - Supportive Content containing the data items required for the support of Mortgage Industry Standards Maintenance Organization (MISMO), a wholly owned subsidiary of the Mortgage Bankers Association. MISMO is dedicated to developing, promoting and maintaining, through an open process, voluntary electronic commerce procedures and standards for the commercial and residential mortgage industries.

Project Scopes

Project Scopes are the method by which business issues are captured within a data warehouse implementation project. A project view defines the business issue in terms of a set of items, possibly from several different constituent models, within a data warehouse instance. The involved models are most likely to include any or all of the data warehouse, Analytical Requirements, Supportive Content and the data warehouse model. Users of the data warehouse can create their own project scopes to support their project requirements. For example, several project scopes can be created in the course of a project, each capturing data items added in a particular phase of the project. Project scopes can also be used to capture the required content of a report or the total coverage of a source system model as mapped into the central warehouse model.

The data warehouse is delivered with over 180 predefined project scopes capturing significant issues likely to be of concern to data warehouse developers. The purpose of these views is to aid the scoping and identification of areas of interest across all data warehouse structures. Predefined views delivered with the data warehouse include:

- **Basel II Project**

  The Basel II project scopes capture important aspects of the three Pillars of the New Capital Accord, commonly known as Basel II.

  Pillar 1 (Minimum Capital Requirements)

  Issues are captured in project scopes centered on Supportive Content. These project scopes record the data requirements for Capital Adequacy calculations under the Standardized and IRB Approaches, for the various risk components within the IRB Approaches, for the Securitization Framework and Operational Risk.

Counter-party Credit Risk	NPR
Counter-party Credit Risk Current Exposure Method	Operational Risk
Counter-party Credit Risk Internal Model Method	Probability Of Default
Counter-party Credit Risk Standardized Method	Securitization Framework
Effective Maturity	Short-Term Maturity Adjustment In IRB Approach
Expected Loss and Provisions	Standardized Counter-party Risk Weights
Exposure At Default	Standardized Risk Weighted Assets
IRB Credit Risk	Treatment of Double Default
Loss Given Default	

  Pillar 2 (Supervisory Review Process)

  Issues are captured in project scopes centered on Analytical Requirements. These project scopes record the analytical reporting requirements that support the management oversight of the organization's risk management processes.

Collateral Management	Operational Risk Assessment
Credit Loss Allowance Analysis	Operational Risk Loss Analysis
Economic Capital Allocation	Outstandings Analysis
Involved Party Exposure	Portfolio Exposure
Location Exposure	Revolving Credit Facility Securitization
Non Performing Loan Analysis	

  Pillar 3 (Market Discipline)

  Issues are captured in project scopes based on Analytical Requirements. These project scopes record the analytical reporting requirements specified in the tables in Part B "The Disclosure Requirements" of Pillar 3 of Basel II.

Allowance for Credit Losses	Credit Risk Mitigation
By Sector or Counter-party Type	Credit Risk Portfolio IRB
Capital Adequacy	Credit Risk Portfolio STD
Capital Adequacy Disclosure IMA	Equity Disclosure Banking Book
Capital Adequacy Disclosure STD	Geographic Breakdown
Capital Structure	Impaired Loan and Allowance
Counter-party Credit Risk	Interest Rate Risk Banking Book
Credit Risk Exposure Detail	Maturity Breakdown
Credit Risk IRB	Operational Risk Basic
Credit Risk IRB Equity	Operational Risk Standardized
Credit Risk IRB Retail	Scope of the Application
Credit Risk Losses IRB	Securitization Disclosure
Credit Risk Losses IRB Advanced	Securitization Early Amortization

- **Anti-Money Laundering**

  Captures analytical reporting requirements related to the detection of money laundering.

Currency Transaction Analysis	International Transportation of Money
Excessive Cash Payments	Suspicious Activity
Foreign Financial Account Analysis	

- **IFRS and IAS**

  Specify the information required for the presentation of Financial Statements.

IAS 1 - Common Practice Reference	IAS 1 - Disclosure Reference
IAS 1 - Reference for Examples	IAS 2 - Definition Reference
IAS 2 - Measurement Reference	IAS 7 - Common Practice Reference
IAS 7 - Disclosure Reference	IAS 7 - Standard Reference
IAS 12 - Disclosure Reference	IAS 14 - Disclosure Reference
IAS 16 - Disclosure Reference	IAS 18 - Disclosure Reference
IAS 19 - Disclosure Reference	IAS 27 - Presentation Reference
IAS 32 - Measurement Reference	IAS 32 - Definition Reference
IAS 33 - Presentation Reference	IAS 32 - Presentation Reference
IAS 37 - Disclosure Reference	IAS 37 - Definition Reference
IAS 37 - Recognition And Derecognition Reference	IAS 37- Measurement Reference
IAS 38 - Disclosure Reference	IAS 38 - Common Practice Reference
IAS 40 - Disclosure Reference	IAS 41 - Disclosure Reference
IFRS 8 - Disclosure Reference	IFRS 7 - Disclosure Reference

- **Sarbanes Oxley**

Sarbanes Oxley Analysis
Notes To Consolidated Financial Statements Analysis
Consolidated Statement Of Cash Flows Analysis
Consolidated Statement Of Changes in Shareholders' Equity Analysis
Consolidated Balance Sheet Analysis
Consolidated Statement Of Income Analysis
Management's Discussion And Analysis Of Financial Condition and Results Of Operations

- **Customer Centricity**

Campaign Analysis	Customer Investment Profile
Customer Insight - Cross Sell	Individual Customer Profile Analysis
Customer Insight - Customer Lifetime Value	Know Your Customer

- **Other**

MISMO eMortgage	Investment Arrangement Analysis
Insurance Product Analysis	Structured Finance Analysis
Insurance Risk Profile	Scorecarding

Analytical Requirements

Designed and built on the strength of two basic assumptions, the data warehouse incorporates the key components for a successful data warehousing solution:

- **Business-oriented**
  Users have a set of business requirements they wish to fulfil.
- **Technology-oriented**
  Data can be made available from which to draw the information.

The challenge to the data warehouse team is to fulfill these two divergent requirements.

Each Analytical Requirement can be divided into:

- **Measures**
  A numerical fact that conveys quantitative information of importance to the organization.
  Examples: Number of Customers and Profit.
- **Dimensions**
  A numerical fact that conveys quantitative information of importance to the organization.
  Examples: Number of Customers and Profit.
  A dimension categorizes measures, such as Time and Product.

Data marts provide a subject-specific analytical layer in a data warehouse solution. Analytical Requirements are structurally similar to data marts, which means that Analytical Requirements enable rapid scoping and prototyping of data marts. Using the data warehouse modeling software, analysts and business users use Analytical Requirements to gather quickly the reporting and analysis requirements of their organization.

As an example of subject-oriented definitions, Analytical Requirements provide the underlying data mart specifications to support the Basel II Pillar 3 Reporting Tables as defined in the Consultative Package 3 documentation, specifically Analytical Requirements support Credit Risk IRB Advanced as well as initial reporting specifications for Market Risk and Operational Risk. Within the data warehouse, these measures and dimensions are mapped back to the data warehouse model so that the scoping of the reporting and analysis requirements automatically selects the most appropriate data warehouse entities and attributes to support those requirements. The BI development team can use these Analytical Requirements to create designs for specific data marts or dimensional solutions that can be used as a source for a range of reports and charts.

Focus Areas

The data warehouse contains Analytical Requirements covering five business focus areas.

- **Asset and Liability Management**

  Maximizes long-term wealth for an Involved Party.

Captial Allocation Analysis	Capital Procurement
Credit Loss Allowance Analysis	Equity Position Exposure
Financial Market Transaction Analysis	Financial Management Accounting
Funds Maturity Analysis	High Value Outward Payment
Interest Rate Sensitivity Analysis	Inward Payment Rate Tolerance
Inward Payment User Activity	Inward Payments
Inward Payments Volume	Liquidity Analysis
Net Interest Margin Variance	Outward Payments
Positions Analysis	Short Term Funding Management
Structured Finance Analysis	VWAP Analysis
Economic Balance Sheet Analysis	

- **Investment Management**

  Emphasizes custody, cash management, performance and attribution, fund accounting and corporate governance.

Class Action Period Holding Analysis	Investment Fund Analysis
Corporate Action Analysis	Performance Analysis
Dynamic Performance Analysis	Performance Versus Benchmark Analysis
Financial Market Lot Analysis	Proxy Vote Analysis
Foreign Exchange Analysis	Securities Available For Lending
Holding Movement Analysis	Settlement Analysis

- **Regulatory Compliance**

  A separate category to support regulatory reporting and AML.

Best Execution Analysis	Continuous Auction Analysis
ECB Reporting	FATCA Implementatin Analysis
Financial Capital Adequacy Analysis	Foreign Financial Account Analysis
Periodic Auction Analysis	Quarterly Transaction Reporting Analysis
Quote Driven Analysis	Sarbanes Oxley Act Analysis
SOX Balance Sheet Analysis	SOX Cash Flow Analysis
SOX Statement of Income Analysis	SOX Account Statement of Change in Shareholders Equity Analysis
Structure of Regulatory Capital	Suspicious Activity Analysis
Transaction Activity Analysis	Transaction Reporting Analysis
Remuneration Analysis	Variable Remuneration Analysis
Capital Adequacy Analysis	

- **Relationship Management**

  Focus on the quality and effectiveness of the Financial Institution's commercial relationships with other Involved Parties

Card Loyalty Analysis	Card Fees Analysis
Payment Card Merchant Analysis	

- **Risk Management**

  Focuses on the impact of potential changes in the organization's business. Extensive work has been done to support the Pillar 3 reporting requirements of Basel II and the implied reporting and analysis requirements of Pillar 2.

Advanced IRB And AMA Analysis	Advanced Risk Based Capital Analysis
Asset Pool Performance Analysis	Authority Profiling
Collections Analysis	Credit Risk Analysis
Credit Risk Assessment	Credit Risk Exposure Analysis
Credit Risk Mitigation Assessment	Customer Credit Risk Profile
Debt Restructure Analysis	Economic Capital Adequacy Analysis
Equity Exposure Analysis	Incremental Risk in the Trading Book
Individual Credit Assessment Analysis	Insurance Risk Profile
Integrated Risk Analysis	Interest Rate Risk Analysis
Involved Party Exposure	Liquidity Risk Analysis
Liquidity Risk Drivers	Liquidity Risk Monitoring
Liquidity Risk Regulatory Standards	Location Exposure
Market Risk Capital Charges Analysis	Market Risk VaR Analysis
Non Performing Loan Analysis	Operational Risk Assessment
Operational Risk Loss Analysis	Oustandings Analysis
Payment Card Fraud Analysis	Portfolio Credit Exposure
Product Risk Analisys	Securitization Analysis
Securitization Detail Analysis	Security Analysis
Value at Risk Analysis	

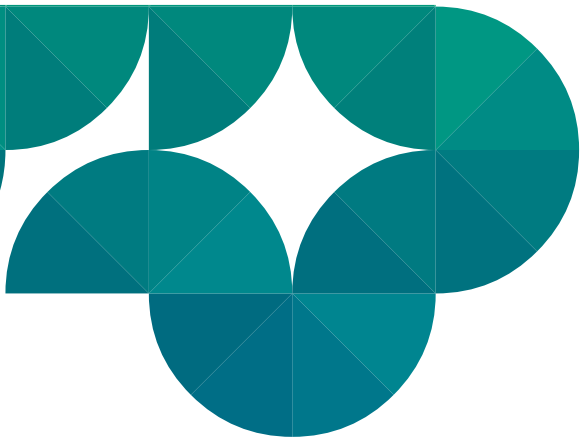
- **Wealth Management**

  Emphasizes portfolio management, relationship management, performance reporting and financial planning.

Asset Allocation Analysis	Client Profitability Analysis
Client Summary Analysis	Portfolio Gains Analysis
Portfolio Performance Analysis	Portfolio Fee and Tax Analysis
Portfolio Risk Analysis	Profit and Loss Attribution Analysis

Implementation

Typically, the data structures are not available or accessible to create a broader, innovative analytics data warehouse or business intelligence platform. Current investments in analytics platforms which were designed to support solely regulatory and quality reporting have started your journey, but they are often engineered and optimized for that purpose. As you move from current tactical needs into the future the data access and consistency across the systems that capture and manage fcustomer, product and operations data will probably not speak the same language. More specifically:



The data you need is available across more than one application but the data cannot be joined across systems that collect the information.
The same data elements may be defined inconsistently, or you may not even have insights into the database - and a significant normalization exercise is necessary to align the data definitions that you can run analytics against.
You do not want to place your agility and ability to innovate in the hands of a single software component - you want to leverage the value those solutions provide - but keep your options open and flexible to implement new scenarios, data sets and analytics as you need them.

Building a data management infrastructure is a complex team effort, requiring contributions across multiple department heads, business analysts and data architects. Establishing a common terminology and target model designed for current and future analytics needs can be an expensive and time consuming effort requiring new resources and skills you may not have in house today dedicated to supporting future programs. Often those resources are tied up supporting day to day operational and planning for tactical initiatives.

A data warehouse is a central repository of summarized data from disparate internal operational systems and external sources. Operational and external source data is extracted, integrated, summarized and stored in a data warehouse that can be accessed by users in a consistent and subject-oriented format. Data organized around business entities is more useful for analysis than data committed to applications that support vertical functions of the business.

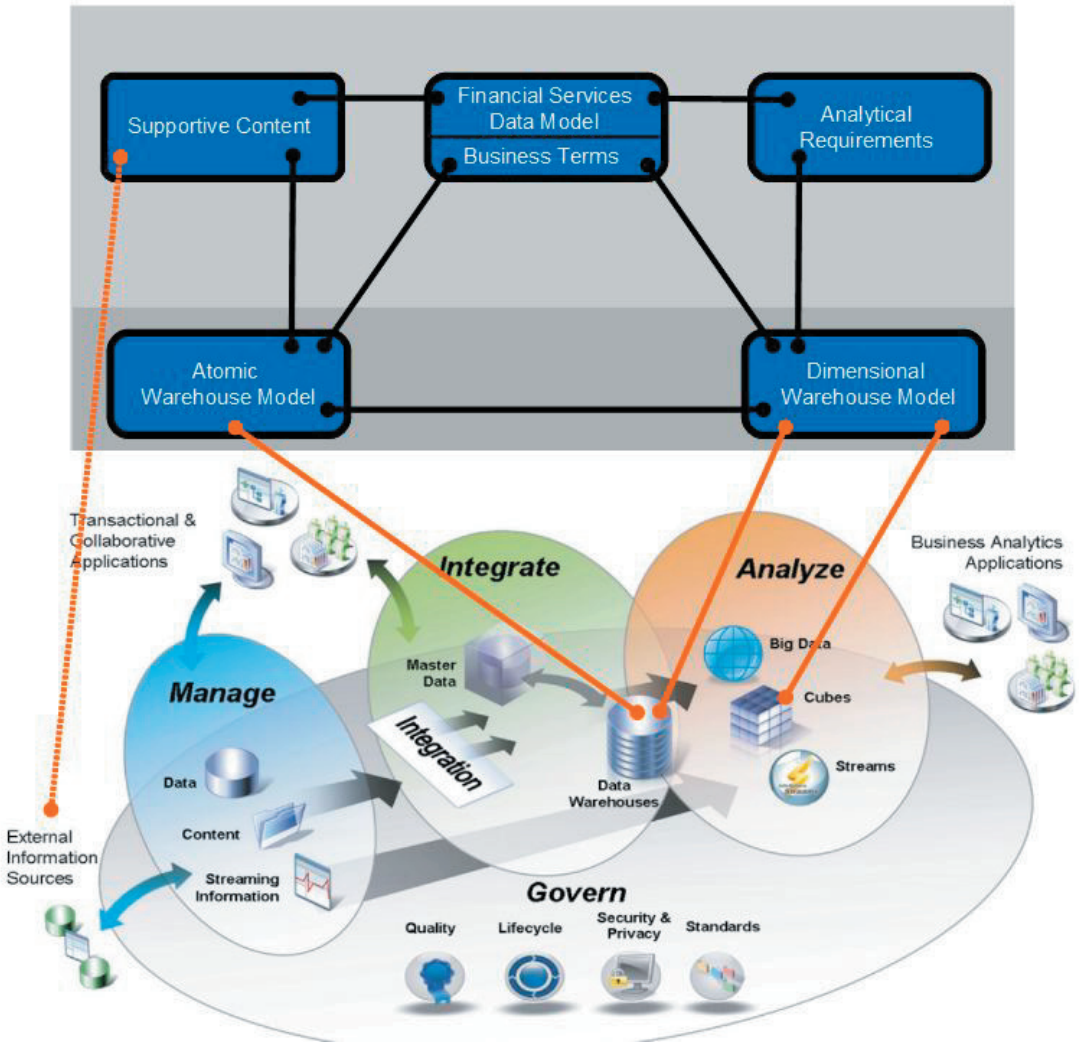
A data warehouse provides online analytical processing (OLAP) rather than online transaction processing (OLTP). Users wishing to perform online analyses can access many records per transaction, while OLTP users can only access one record at a time. Analytical users rarely update data and can cope with response times that are not instantaneous, while OLTP users constantly update individual records and expect sub-second response times. An OLAP environment supports analytical queries against data, representing an organization's state at a specific point in time or over a period of time, since support of history is a key element of data warehousing. This type of tool also allows users to drill down to the summarized information for further detail.

The data warehouse is a single source of consolidated data that provides an enterprise-wide view of the business that becomes the main source of information for reporting and analyzing data marts that are usually departmental, line-of-business-oriented or business-function-oriented. The data warehouse overcomes limitations of older style decision-support systems:

Complex, ad-hoc queries are submitted and executed rapidly because the data is stored in a consistent format
Queries do not interfere with ongoing operations because the system is dedicated to serving as a data warehouse
Data is consolidated from multiple sources, enabling organization by useful categories such as customer or product.

The data warehouse holds data about the business that can be used as the basis for supporting a detailed analysis of the areas of most concern to organizations today. This allows organizations to exploit the potential of information previously locked in legacy systems inaccessible to the business user:

The data warehouse promotes an open architecture in which each component adheres to industry standards. This allows organizations to implement the data warehouse using existing tools or preferred tools. The physical environment of the data warehouse provides organizations with a physical data warehouse infrastructure that is tightly integrated with the logical environment incorporating both the data warehouse model and Analytical Requirements. Organizations can automatically generate the required data structures for a full data warehouse physical environment. Analytical Requirements provide the basis for the design of physical structures that support OLAP Analysis, such as star schemas. Analytical Requirements provide substantial domain expertise to fast start projects, assisting in bringing them to rapid implementation and benefits realization. The use of the data warehouse enables enterprise-wide standard definitions and consistency for all business intelligence data, while delivering this data across the organization on consolidated or multiple platforms. This allows for lower-cost maintenance and centralized control of all data, while retaining flexibility to enable users to select their preferred analytical applications for ease of use, preformed reports or complex analytics capabilities.



IBM InfoSphere Data Architect is a collaborative data design solution that helps you discover, model, relate, standardize, and integrate diverse and distributed data assets. It can be used to manage and extend the Banking Data Warehouse models. Using it can simplify and speed up warehouse design, dimensional modeling, and change management by providing a tool to the warehouse data modelers and database administrators to design and manage a warehouse from an enterprise logical model.

IBM InfoSphere Business Glossary enables the creating and managing an enterprise vocabulary and classification system, with ready to use industry standard terms and definitions. It facilitates collaboration between business and technical users: data analysts, data modelers, BI and ETL developers, data stewards, business analysts, line of business managers, and governance committees.

IBM InfoSphere Information Server is a data integration platform that helps customers understand, cleanse, transform & deliver trusted information to business initiatives including business analytics and data warehousing. It helps to create an accurate understanding of the business context associated with data for Line of Business and a comprehensive understanding of end to end data lineage for better governance.

IBM InfoSphere Warehouse is a complete data warehouse platform that delivers superior scalability and availability, design, build, and management tooling, and business analytics. DB2 10 provides a powerful engine for dynamic warehousing with advanced features.

IBM Cognos software can provide what your organization needs to become top-performing and analytics-driven. It helps users freely explore information, analyze key facts, quickly collaborate to gain alignment with key stakeholders and plan and act with confidence to drive better business outcomes.

IBM Smart Analytics System is a deeply integrated and optimized, ready-to-use analytics solution that provides broad analytics capabilities on a powerful warehouse foundation with IBM server and storage. The IBM Smart Analytics System family offerings span multiple hardware platforms and architectures providing maximum flexibility for deployment. They are pre-integrated and optimized to ensure quick implementation with rapid delivery of value.

IBM Netezza provides simple deployment, out-of-the-box optimization, no tuning and minimal on-going maintenance. The Netezza data warehouse appliance has the industry's fastest time-to-value and lowest total-cost-of-ownership. It is a purpose-built, standards-based data warehouse appliance that architecturally integrates database, advanced analytics, server and storage into a single, easy-to-manage system that offers significant performance and scalability.

Business Scope

Asset and Liability Management

Capital Allocation Analysis - To evaluate compliance under various capital allocation schemes and regulatory scenarios. Capital loans are made available to the financial services organization either by a regulatory process from the Central Bank or via discretionary loans made available by the financial services organization itself. The loans are subjected to stringent rules of compliance and use and there is usually a requirement to report back to the lender commenting and illustrating the use of the loan and that it is being used under the agreed terms and conditions
Typical Measures: Return on Equity, Return on Capital
Typical Dimensions: Capital Type, Line of Business Reporting Group

Capital Procurement - To identify, classify and structure methods of generating outside capital according to the different types of instruments and their characteristics such as cost and risk. When looking to obtain outside capital from various market sectors there are different processes to adhere to in order to obtain the loan. The primary factors to take into consideration when looking for, evaluating and making a formal plan for obtaining the loan is to be aware of the Costs in obtaining the loan against the return on the use of it and also to look at the risks involved.
Typical Measures: Risk Adjusted Return On Capital, Capital Volume
Typical Dimensions: Arrangement Commitment Term, Organization Unit Geography

Credit Loss Allowance Analysis - To determine and analyze the ongoing amount of reserve funds needed as a buffer against loan defaults and for contingency in case of unexpected events that require additional capital funds. Financial services organizations pay interest on money deposited with them to the investors to whom the money belongs. The financial services organization will then make use of this money on deposit for loans to other individuals and services organizations charging a higher rate of interest than that paid out to the depositors. There needs to be analysis done on estimating what percentage of the deposited money needs to be retained by the financial services organization in order to be able to pay any and all of the depositors who may suddenly request the return of their money. This may occur due to factors such as a sudden loss of confidence in the financial services organization. If there are not sufficient funds to meet a sudden demand then this leads to a further lack of confidence and ultimately to the failure and possible closure of the financial services organization. Money typically utilized, as this allowance would be that which was deposited in the short-term investment accounts. Money deposited in long term investments and in Notice accounts tend to be less likely to be withdrawn without notice and can then be safely reinvested by the financial services organization into other loans.
Typical Measures: Loan Loss Allowance, Loss Coverage Ratio
Typical Dimensions: Product Type, Line of Business Reporting Group

Equity Position Exposure - To provide an overall analysis of trading book positions, report on the reliability of valuation estimates, review the performance accuracy of internal models and support independent verification of financial instrument prices.
Typical Measures: Total Annual Equity Value, Realized Trading Gain In Period
Typical Dimensions: Equity Holding Intention Type, Investment Type

Financial Management Accounting - Financial Management Accounting analysis is used to measure and report the financial results of the financial services organization and to provide other analytical information such as statistical and financial data for internal use of the management of the financial services organization.
For example, production of Balance Sheets, Income Statements (Profit and Loss Accounts), allocation of costs between organization units, as well as key indicators of the financial strength of the financial services organization, such as Capital Adequacy.
Typical Measures: Off Balance Sheet Accounts, Income, Expense
Typical Dimensions: Organization Unit Geography, Allocation Type

Financial Market Transaction Analysis - To analyze a group of financial market transactions for the purposes of reporting to management or clients.
Typical Measures: Total Transaction Value, Total Commission Fees
Typical Dimensions: Financial Market Instrument, Financial Market Transaction Forward Type

Funds Maturity Analysis - To project the financial services organization's assets and liability maturity position after changes caused by inflows and outflows of cash. The financial services organization management will need to constantly be able to report on or enquire in the current Net Position or where the financial services organization stands with regards to their total assets or liability after all liabilities have been accounted for. There is also the need to be able to project where this position could be given that data is scheduled to come in or go out of the financial services organization.
Typical Measures: Net Asset/Liability Position, Liquidity Ratio
Typical Dimensions: Arrangement Commitment Term, Arrangement Time to Maturity Segment

High Value Outward Payment - To determine and analyze all outbound payments as a subset of the outward payment category (i.e., take a value band such as £5k-£25k and provide more detail on the rules applied to this segment of payments).
Typical Measures: Total Payment Settlement Amount, Total Instructed Amount
Typical Dimensions: Payment Currency, Transfer Type

Interest Rate Sensitivity Analysis - To project changes to the financial services organization's interest rate differential caused by interest rate changes. This differential can be referred to as the Rate Sensitivity Gap, which is a way of measuring the difference between rate sensitive assets and rate sensitive liabilities. This indicates the probable effect of interest rate changes on the financial services organization's net interest income - for example, if the Rate Sensitivity Gap is negative (indicating that the rate sensitive liabilities are greater than the rate sensitive assets), it indicates that the financial services organization's net interest income is likely to decrease if interest rates rise.
Typical Measures: Rate Sensitivity Gap
Typical Dimensions: Interest Rate Type, Interest Rate Segment

Inwards Payments Volume - To determine and analyze a categorization of the inward payments report (i.e. volume of domestic).
Typical Measures: Total Number of Messages Received, Total Number of Messages STP
Typical Dimensions: Message Type, Transfer Type
Inward Payment User Activity - To determine and analyze the number of actions taken by a user regarding the number of times they have processed a payment. It is not a measure of the actual number of payment messages processed e.g. a single payment message may be actioned a number of times depending on whether the action has been rejected by the verifier.
Typical Measures: Total Messages Repaired, Total Messages, Rejected
Typical Dimensions: Message Type, Transfer Type

Inward Payment Rate Tolerance - To determine and analyze the incoming payments where the Rate Tolerance was exceeded. The rate could be applied by a dealer, the Rate Card or Margin Engine.
Typical Measures: Total Original Currency Amount, Total Converted Currency Amount
Typical Dimensions: Message Type, Transfer Type

Liquidity Analysis - To provide analysis of the projected inflows and outflows of cash to/from the financial services organization. By knowing what the liquidity status of the financial services organization would be given that anticipated inflows or outflows of cash occur would enable a program of expansion and development to take place or for a period of rationalization and contraction to occur.
Typical Measures: Net Flow
Typical Dimensions: Cash Flow Availability, Resource Item Value Segment

Net Interest Margin Variance - To evaluate the variability of assets and liabilities due to fluctuation in interest rates. Even without receiving in or paying out any monies from the financial services organization would not result in a stable and static balance sheet. This is due to the factors of a variable interest rate and variable rate of inflation both of which will affect the projected returns or payments on the amounts of money already allocated. This will not just depend on the home economy fluctuations but also on the international economies where the variances in currencies around the world and the changing interest rates internationally will affect the 'status quo' of a financial services organization's monetary position.
Typical Measures: Net Interest Margin
Typical Dimensions: Interest Type, Arrangement Commitment Term

Outward Payments - To determine and analyze all outbound payments within a given time period, usually daily.
Typical Measures: Total Payment Settled Amount, Total Receiver Charge
Typical Dimensions: Payment Collection Method, Transfer Type

Positions Analysis - To analyze and report the trading positions held by the financial institution.
Typical Measures: Position Quantity, Financial Market Instrument Volatility
Typical Dimensions: Financial Market Instrument, Geographic Region

Short Term Funding Management - To identify and analyze sources of short-term funding to fulfil the financial services organization's asset, liability and liquidity plans. The financial services organization needs to have either on hand or able to call upon other services organizations for funds if it requires to satisfy a need for short term funding. This could be a sudden unexpected rush of depositors requiring their short term monetary holdings back due to a loss of confidence in the security of their money at the financial services organization or that a large amount of medium to long term held deposits all came to maturity at the same time such as in the case of the now defunct TESSA savings accounts.
Typical Measures: Funding Requirement, Funding Capacity
Typical Dimensions: Organization Unit Function, Line of Business Reporting Group

Structured Finance Analysis - To identify the utilized and unutilized credit associated with Structured Finance arrangements, together with interest and fee amounts. Hence to monitor the performance and profitability of the Structured Finance arrangements. A Structured Finance arrangement is a Financial Engineering Service in which the financial services organization arranges for credit to be provided to an Involved Party by a group of Involved Parties. The syndicated credit can be for any types of credit such as loans, guarantees, backup facilities or funding for complex, long term projects. The analysis is to identify how the credit arranged for the Involved Party is being used and also to identify if credit arranged is not being used and why this would be. It may be that advice from the financial services organization on the use of the credit is required by the Involved Party and that there is an opportunity for the financial services organization to make money out of the sale of its products or services by getting the Involved Party to make use of the credit which the financial services organization had been paid to arrange to be available.
Typical Measures: Number of Credit Extensions, Total Draw down Amount
Typical Dimensions: Repayment Period, Arrangement Financial Status

VWAP Analysis - To report the daily Volume Weighted Average Price (VWAP) and related statistics for a selected instrument. Note that this is for the purpose of retrospective, post-trade analysis, not pretrade decision support.
Typical Measures: Volume Weighted Average Price, Tick Count
Typical Dimensions: Financial Market Transaction Group, Time Period

Investment Management

Class Action Period Holding Analysis - To support the financial institution in the analysis of the effect of Class Actions on the value of its investment holdings.
Typical Measures: Total Class Action Amount Paid, Total Closing Quantity Held
Typical Dimensions: Time Period, Investment Manager

Corporate Action Analysis - To support the financial institution in the analysis of the effect of Corporate Actions upon investment funds and investment plans.
Typical Measures: Equity Conversion Rate, Total Cost Allocation
Typical Dimensions: Investment Plan, Equity Instrument

Dynamic Performance Analysis - To support the financial institution in the analysis of investment fund and plan performance on a dynamic or "ad-hoc" basis i.e. reports fund statistics, including returns, at any historical point in time based on dimension values chosen.
Typical Measures: Benchmark Return, Excess Return
Typical Dimensions: Time Period, Asset Class

Financial Market Lot Analysis - Supports the analysis of Financial Market Lots.
Typical Measures: Lot Market Value, Total Lot Cost Amount
Typical Dimensions: Time Period, Financial Market Lot

Foreign Exchange Analysis - Supports the analysis of Foreign Exchange transactions in respect of Investment Funds.
Typical Measures: Total Amount Purchased, Total Amount Sold
Typical Dimensions: Investment Fund, Executing Broker

Holding Movement Analysis - This Analytical Requirement supports the analysis of Investment Fund holding movements.
Typical Measures: Total Purchases Value, Total Sales Value
Typical Dimensions: Asset Class, Financial Market Instrument

Investment Fund Analysis - To support the basic analysis of activity in Investment Funds.
Typical Measures: Total Market Value, Investment Fund Net Assets
Typical Dimensions: Asset Class, Investment Fund

Performance Analysis - To support the financial institution in the analysis of investment fund and plan performance.
Typical Measures: Fiscal YTD Excess Return, One Month Excess Return
Typical Dimensions: Asset Class, Industry Sector

Performance Versus Benchmark Analysis - To support the financial institution in the analysis of investment fund and plan performance compared to benchmarks.
Typical Measures: Total Market Value, Performance v Benchmark Three Month Return
Typical Dimensions: Asset Class, Investment Plan

Proxy Vote Analysis - To support the financial institution in the analysis of the issues in respect of Proxy Voting on Ballots in respect of Equity Instruments held.
Typical Measures: Total Equity Held Quantity, Total Equity On Loan Quantity
Typical Dimensions: Investment Fund, Proxy Agent

Securities Available For Lending - This Analytical Requirement supports the analysis of securities lending.
Typical Measures: Available For Lending Amount, Lending Position Amount
Typical Dimensions: Financial Market Instrument, Time Period

Settlement Analysis - This Analytical Requirement supports the analysis of settlement arising from trades related to Investment Funds. Trades obtain Assets as holdings for Investment Funds and liquidate Asset Holdings when no longer required.
Typical Measures: Settlement Asset Value, Open Sales Settlement Amount
Typical Dimensions: Executing Broker, Time Period

Regulatory Compliance

Best Execution Analysis - Capital Adequacy Analysis contains the key measures related specifically to capital adequacy of a Financial Institution, measured for a specific Measurement Period.

Capital Adequacy Analysis - To support the financial institution in the generation of reports and the analysis of data in relation to Article 21 of the Markets in Financial Instruments Directive (MiFID).
Typical Measures: Financial Market Order Quantity, Financial Market Transaction Price
Typical Dimensions: Financial Market Order Identification, Financial Market Instrument

Continuous Auction Analysis - To support the financial institution in the analysis of data in relation to Article 17 of the Markets in Financial Instruments Directive (MiFID). Also relevant to the Trade-Through Rule of Reg NMS.
Typical Measures: First Bid And Offer, Second Bid And Offer
Typical Dimensions: Financial Market Instrument, Time Period

ECB Reporting - The statistical reporting requirements foreseen by the European Central Bank (ECB) for Monetary financial services organizations within the European Monetary Union area. This assists the financial services organization in the analysis of arrangement balances and credit or debit totals throughout the reporting period, broken down by the purpose of the loan, the sector or residency of the counterparty and the currency of the arrangement.
Typical Measures: Total Credits In Period, Total Debits In Period
Typical Dimensions: ECB Lending Purpose, ECB Counter-party Residency

FATCA Implementation Analysis - The Foreign Account Tax Compliance Act (FATCA) is a U.S. development in to improve tax compliance involving foreign financial assets and offshore accounts for persons subject to U.S. taxation. This allows the Financial Institution to:
- analyse the current mix of customers who may be subject to foreign financial asset reporting under FATCA, for financial institutions who are outside the U.S.,
- identifiy the gross level measures that those customers would need to report to the Internal Revenue Service of the United States.
- analyse the geographical spread of U.S. Persons, with a view to assessing where the expertise for FATCA compliance needs to be centred to cater for the greatest number of customers.

Financial Capital Adequacy Analysis - To analyze the financial services organization's regulatory capital requirements for a number of different types of risk, and compare the amount of required regulatory capital for the specified risk types, against the total amount of recognized regulatory capital available to the financial services organization. For regulatory reporting requirements such as those defined in The New Basel Capital Accord by the Basel Committee for Banking Supervision, it is essential for the financial services organization to be able to analyze and report on their capital situation with regard to the required regulatory capital amount and the amount which is deficient or in surplus of that requirement for credit, market and operational risk. They also need to be able to break capital requirements down into Tier totals and capital adequacy ratios and be able to identify the value at risk throughout the measurement period.
Typical Measures: Total Capital Deficiency Amount, Value At Risk
Typical Dimensions: Financial Institution Group Reporting Structure, Consolidation Method

Foreign Financial Account Analysis - To analyze the financial services organization's Foreign Financial Accounts in an effort to curb money laundering and other fraudulent activities. With new anti money laundering legislation enforced worldwide, there is an increasing need for the financial services organization to analyze their accounts so they can identify and report illegitimate accounts or customers. This would include the analysis of their foreign account balances, the location of the account creation, the individuals or organizations creating those accounts and a study of those parties including their address, method of identification, nationality, etc.
Typical Measures: Number Of Joint Owners, Foreign Exchange Margin Income
Typical Dimensions: Account Type, Country Of Account

Periodic Auction Analysis - To support the financial institution in the analysis of data in relation to Article 17 of the Markets in Financial Instruments Directive (MiFID). Also relevant to the Trade-Through Rule of Reg NMS.
Typical Measures: Periodic Auction Satisfied Bid, Periodic Auction Satisfied Offer
Typical Dimensions: Financial Market Instrument, Time Period

Quarterly Transaction Reporting Analysis - To support the financial institution in the generation of reports and the analysis of data in relation to Article 27 of MiFID. Also relevant to SEC transaction reporting.
Typical Measures: Total SI Shares Traded, Average Price SI Shares
Typical Dimensions: Financial Market Instrument, Broker Transaction Type

Quote Driven Analysis - To support the financial institution in the analysis of data in relation to Article 17 of the Markets in Financial Instruments Directive (MiFID). Also relevant to the Trade-Through Rule of Reg NMS.
Typical Measures: Best Bid Price, Best Bid Price Volume
Typical Dimensions: Financial Market Instrument, Time Period

Sarbanes Oxley Act Analysis (SOX) - To support the financial institution in the generation and analysis of the Security And Exchange Commissions (SEC) 10Q and 10K reports which support the financial institution with regard to compliance with Sections 302 and 404 of the Sarbanes Oxley Act
Typical Measures: Capital, Net Income, Total Assets, Capital Ratios
Typical Dimensions: Financial Institution Group Reporting Structure, Reporting Currency

Sarbanes Oxley Act Balance Sheet Analysis - To analyze the financial services organization's 10Q and 10K Balance Sheets which report the financial services organization's total assets, total liabilities and total shareholders equity at a specific time. The Sarbanes Oxley Act Balance Sheet Analysis template assists financial services organizations in optimizing report generation with regard to the Securities And Exchange Commissions (SEC) 10Q and 10K regulatory filing requirements.
Typical Measures: Working Capital, Profit, Loan Loss Allowance Ratio
Typical Dimensions: Line Of Business Reporting Group, Organization Unit

Sarbanes Oxley Act Cash Flow Analysis - To analyze a financial services organization's Cash Flow which is the amount of cash a financial services organization generates and uses during a period, calculated by adding non-cash charges (such as depreciation) to the net income after taxes. The Sarbanes Oxley Act Cash Flow Analysis template assists financial services organizations in optimizing report generation with regard to the Securities And Exchange Commissions (SEC) 10Q and 10K regulatory filing requirements.
Typical Measures: Net Income, Supplemental Disclosures On Continuing Operations
Typical Dimensions: Line Of Business Reporting Group, Organization Unit

Sarbanes Oxley Act Statement Of Change In Shareholders' Equity Analysis - To analyze a financial institution's Statement Of Changes In Shareholders' Equity which includes net profit / loss for period, other gains and losses recognized directly in shareholders equity and the impact of changes in accounting policy and fundamental errors when these are presented as a prior period adjustment. The Sarbanes Oxley Act Statement Of Changes In Shareholders' Equity Analysis template assists financial institutions in optimizing report generation with regard to the Securities And Exchange Commissions (SEC) 10Q and 10K regulatory filing requirements.
Typical Measures: Capital, Net Income
Typical Dimensions: Time Period, Line Of Business Reporting Group

Sarbanes Oxley Act Statement Of Income Analysis - To analyze a financial services organization Income Statement which is a financial report that by summarizing revenues and expenses, and showing the net profit or loss in a specified accounting period it depicts a financial services organization's financial performance due to operations as well as other activities rendering gains or losses. Also known as the profit and loss statement. The Sarbanes Oxley Act Statement Of Income Analysis template assists financial services organizations in optimizing report generation with regard to the Securities And Exchange Commissions (SEC) 10Q and 10K regulatory filing requirements.
Typical Measures: Earnings Per Share Information, Income, Long Term Debt
Typical Dimensions: Line Of Business Reporting Group, Measurement Currency

Structure Of Regulatory Capital - To analyze the amount and types of supervisory or regulatory recognized capital available to the financial services organization. For regulatory reporting requirements such as those defined in The New Basel Capital Accord by the Basel Committee for Banking Supervision, it is essential for the financial services organization to analyze and report on their capital situation with regard to the required regulatory capital amount for the consolidated financial services organization reporting group. They may be required to segregate the capital requirement into overall eligible capital and multiple tier capital which may be further divided into stock, reserves, capital instruments, goodwill and other surplus capital. The financial services organization may be required to disclose such values including the method of consolidation the financial accounts of each legal entity within the financial services group.
Typical Measures: Capital Deduction Amount For Group Entity, Surplus Capital
Typical Dimensions: Consolidation Method, Financial Institution Group Reporting Structure

Suspicious Activity Analysis - To identify suspicious transactions between the financial services organization and its customers in an attempt to target money laundering activities. With new anti money laundering legislation enforced worldwide, there is an increasing need for the financial services organization to analyze their accounts, customers and activities so they can identify and report fraudulent and suspicious activities. Some activities may be easily identified as

fraudulent, however others may require a much more in-depth analysis over a longer measurement period. To do this, a financial services organization needs to have a clear understanding of those activities identified as fraudulent and it needs to have the ability to analysis historic data for trends in activities, which at an individual level are acceptable, but when analyzed as a group may be considered suspicious. A financial services organization also needs to have a better understanding of their customers. It needs to record information such as geographic residency and employment of the customer, method of identification to the financial services organization for the creation of accounts and completion of transactions. The ultimate aim of Suspicious Activity analysis, is to identify who is involved in the activity as a provider and as a recipient of funds and if all the activities are legitimate.
Typical Measures: Number Of Suspicious Transactions, Inter Company Borrowings
Typical Dimensions: Alias Or Doing Business As Name, Organization Economic Intent

Transaction Activity Analysis - To enable the transactions that are handled by the financial services organization to be analyzed with a view to monitoring currency transactions and international transportation of money in an effort to curb money laundering and other fraudulent activities. With new anti money laundering legislation enforced worldwide, there is an increasing need for the financial services organization to analyze the activities on their accounts so they can identify and report fraudulent and suspicious activities. The financial services organization needs to analyze patterns in the activities on accounts which would include the amount transferred in a transaction, frequency of the transaction and particular traits of the transactions such as time of day, currency of transaction or the method by which the transaction was processed. It is also important for the financial services organization to identify the geographic properties of the transaction including where it was initiated and to whom and where the funds are to be received.
Typical Measures: Total Transaction Amount, Foreign Exchange Conversion Charges
Typical Dimensions: Geographic Area Of Transaction Destination, Funded Currency

Transaction Reporting Analysis - To support the financial institution in the generation of reports and the analysis of data in relation to Article 27 of MiFID. Also relevant to SEC transaction reporting.
Typical Measures: Average Transaction Unit Price, Traded Volume
Typical Dimensions: Financial Market Instrument, Financial Market Transaction Venue

Remuneration Analysis - To support the financial institution in reporting the remuneration payments of its employees as set out in the Capital Requirements Directive (CRD) III (and others). Remuneration Analysis represents the lowest level of payments granularity, recording paid and outstanding amounts across remuneration types, line of business and employment position (amongst others).

Variable Remuneration Analysis - TTo support the financial institution in reporting the remuneration payments of its employees as set out in the Capital Requirements Directive (CRD) III (and others). Performance Based Pay Analysis concentrates on the variable payments aspects of employee remuneration and in particular captures the impacts of performance related bonuses, both deferred and non-deferred, across lines of business and employment positions.

Risk Management

Advanced IRB And AMA Analysis - To summarize risk-weighted asset information for banks approved to use advanced internal ratings-based and advanced measurement approaches for regulatory capital purposes.
Typical Measures: Total Exposure At Default, Total Weighted Average Effective Maturity
Typical Dimensions: Credit Risk Approach Type, Protection Provider Treatment Approach

Advanced Risk Based Capital Analysis - To analyze the Risk-Based Capital Numerator and Ratios for Banks and Bank Holding Companies.
Typical Measures: Total Tier 1 Capital, Allowable Tier 2 Capital
Typical Dimensions: Time Period

Asset Pool Performance Analysis - To analyze how a pool of assets are performing. Facets of the pool performance include the value of the assets, the value of late or default asset payments and the relationship of the asset value to any securitization.
Typical Measures: Total Security Value Secured, Total Asset Quantity
Typical Dimensions: Securitized Product Type, Exposure Currency

Authority Profiling - To evaluate the risk of providing credit and settlement authorization to employees, organization units, organization unit groups, subsidiaries, agencies and employment positions. It is important to know keep track on the responsibilities and authorization limits accorded to individuals and bodies of people with regards to the provision of credit lines on products and to customers and the settlement limits on arrangements and the allowance of writing off those debts deemed too costly to recover.
Typical Measures: Total Arrears, Total Credit Amount Secured, Total Credit Limit
Typical Dimensions: Organization Unit Authority Designation, Credit Authority Level

Collections Analysis - To determine trends in the collection of loan repayments according to the number of repayments collected, rejected or past due. By keeping information regarding the various reasons and methods for the repayment of loans adopted by customers in relation to their personal characteristics, geographic location and past history on repayments will enable the financial services organization to create a Risk rating for customers. This will enable them to assess the risk associated with that customer potentially taking out other products requiring repayment or applying the risk rating to similar types of customers taking out a product.
Typical Measures: Total Loan Repayment Amount Collected, Number of Loan Repayments Past Due
Typical Dimensions: Expected Default of Counter-party, Line of Credit Unutilized Range

Credit Risk Analysis - To analyze the financial services organization's credit risk in terms of earnings volatility due to variations in credit losses. Financial services organizations make their money not on money deposited but on monies lent and the interest accrued during the term of the repayment period. However the risk of never recovering the monies lent could outweigh the potential profit earned from the loan. By keeping information regarding the various losses incurred on loans and the circumstances relating to each loss will enable the financial services organization to reduce their risk by being more selective to whom and in what circumstances loans are made. It is not to eliminate the risk but rather reduce it in relation to the interest earned.
Typical Measures: Number of Non Performing Accounts, Ratio of Security to Credit
Typical Dimensions: Credit Reinstatement Status, Customer Net Worth

Credit Risk Assessment - To analyze the credit risks of the financial services organization, in accordance with the guidance for Pillar 2 - Supervisory Review Process and Pillar 3 - Market Discipline in The New Basel Capital Accord from the Basel Committee for Banking Supervision, Bank for International Settlements. In addition to the general requirements of Credit Risk analysis, a financial services organization may have additional reporting requirements to be in compliance with a particular banking standard. For example, in The New Basel Capital Accord, a financial services organization is required to disclose information on their outstanding exposures and allowances reserved to cover a loss scenario. Depending on the complexity of their business, a financial services organization may gain approval from the regulators, to use a higher standard of risk calculation. Rewards include a more comprehensive risk system, improved credit rating and the approval to hold a lower capital reserve amount, thereby releasing more funds into the business. In this case, the bank will be required to disclose more generated statistics such as the probability that a customer will default, the exposure at the time of the default and expected loss and recovery amount in case of that default.
Typical Measures: Total Risk Weighted Assets, Capital Adequacy Ratio
Typical Dimensions: Financial Institution Group Reporting Structure, Arrangement Time To Maturity Segment

Credit Risk Exposure Analysis - To analyze the credit risk of various exposure categories. In particular, to address the requirements of Schedules C to J of FFIEC 101, a US Advanced Capital Adequacy Frameworks supplemental report.
Typical Measures: Total Weighted Average Obligor PD, Total Exposure At Default
Typical Dimensions: IRB Advanced CAF Exposure Class, Probability Of Default Category

Credit Risk Mitigation Assessment - To analyze the credit risks mitigation of the financial services organization, in accordance with the guidance for Pillar 2 - Supervisory Review Process and Pillar 3 - Market Discipline in The New Basel Capital Accord from the Basel Committee for Banking Supervision, Bank for International Settlements. In addition to the general requirements of Credit Risk assessment, a financial services organization may have additional reporting requirements to be in compliance with a particular banking standard. For example, in The New Basel Capital Accord, a financial services organization is required to disclose information on their credit risk mitigation techniques and the effect such mitigation has on the financial services organization's outstanding exposures. A financial services organization will be required to disclose information on the type and value of the underlying asset that was given as security when the financial services organization issued the credit. A financial services organization needs to determine this information so that it has a better account of its financial assets. Should a default on a loan occur, the financial services organization has a clear understanding of the actual exposure it has, how quickly it can realize funds from the asset and how much it may stand to loose on the overall loan. The financial services organization will also require this information if it intends to offset a large number of its positions in a netting agreement with one of its trading partners.
Typical Measures: Total Collateralized Exposure Amt After Netting, Undrawn Commitments Amount
Typical Dimensions: Netting Method Type, Collateral Risk Weighting

Customer Credit Risk Profile - To determine profiles of Customer Credit Risk in terms of the amount of credit in arrears, average balances, credit score and customer balance sheet, and thereby help to reduce the risk of customer credit by forecasting the profile of the customer most likely to incur credit risk and give preventative advice. By holding this information it reduces the risk the financial services organization exposes itself to by regulating the amount and types of new customers it takes on and the amount of exposure it takes on with existing customers requesting loans when their circumstances do not make this a feasible option.
Typical Measures: Number of Non Performing Accounts, Amount of Principal Arrears
Typical Dimensions: Customer Net Worth, Financial Legal Status Type

Debt Restructure Analysis - To determine how a loan arrangement considered to be at risk is being conducted in relation to its applied limits, collateral margin, fee income generated and residual transferable asset value, and thereby help to determine an optimal restructuring formula. This is to reduce the risk for the financial services organization by getting the loan at risk back on track and avoid it progressing into a possible Write Off situation. It also encourages the customer to review their financial situation, make changes to their proposed repayment structure with assistance from the financial services organization, provide additional security if available and generally encourages the relationship between the customer and the financial services organization at a lower risk.
Typical Measures: Percentage of Collateral Value per Loan, Ratio of Loan Utilized to Approved Limit
Typical Dimensions: Arrangement Negotiated Settlement Type, Debt Restructure Difficulty Level

Economic Capital Analysis - Economic Capital Comparison Analysis compares the different forms of capital with the Economic Capital.
Typical Measures: Risk Adjusted Return On Capital, Market Value At Risk
Typical Dimensions: Measurement Currency, Organization

Equity Exposure Analysis - To analyze the detail of Equity Exposures subject to the advanced approaches rules.
Typical Measures: Total Equity Exposure Amount, Estimate Of Loss RWA Amount
Typical Dimensions: Equity Risk Approach Type, Portfolio Type

Incremental Risk In The Trading Book - The Basel Committee on Banking Supervision "Guidelines for computing capital for incremental risk in the trading book" July 2009, contains a number of other factors which a financial institution must consider when computing the Incremental Risk. Under the proposed rule, a bank that models specific risk for one or more portfolios of covered positions would be required to measure the incremental default risk of those positions. Incremental default risk would be defined as the default risk of a covered position that is not reflected in the bank's VaR-based measure because it reflects risk beyond a ten-business-day horizon and a 99% confidence level. In the case of a securitization exposure, incremental default risk includes the risk of losses that could result from default of the assets underlying the securitization exposure. A bank would be required to measure incremental default risk for both covered debt and equity positions.
Typical Measures: Incremental Default Risk Charge, Total Exposure Amount
Typical Dimensions: Value At Risk Horizon, Sources Of Liquidity Risk

Individual Credit Assessment Analysis - To assess the credit worthiness of a set of Individual Customer arrangements according to the behavior of those arrangements over time. The Individual Credit Assessment Analysis can also be used to historically evaluate the success and accuracy of credit scoring.

Insurance Risk Profile - To identify the risk factors, income and costs associated with the Customers and Resource Items insured by the financial services organization, and thereby to establish if a prospective Insurance Arrangement is a good risk. The financial services organization needs to be sure that the customer is ready, willing and able to afford the necessary repayments for the insurance of their resources and also that the resources being insured are considered worth doing both in asset value and the likelihood that the insurance cover will be called into force by the customer due to a high probability that the resource will become defective.
Typical Measures: Number of Arrangements, Total Amount of Claim Payments
Typical Dimensions: Individual Age Group, Individual Health Status

Integrated Risk Analysis - To support the reporting of a financial institution's key risk measures in an integrated fashion. Encompasses market, credit, operational and liquidity risk.
Typical Measures: Capital Adequacy Ratio, Earnings At Risk
Typical Dimensions: Portfolio, Credit Risk Accounting Category

Interest Rate Risk Analysis - To analyze the exposure of an asset or liability to market fluctuations in the level of interest rates. The fluctuating rate of interest in the market place and the rate of inflation are factors, which financial services organizations have to constantly be aware of in order to increase the interest rate to customers on deposits when the interest rate on loans rises and also to reduce the interest rate to customers on deposits when the interest rate on loans is low. This information is used to not just to keep in line with the government strategy of interest to inflation but also to insure that you remain competitive with the other financial services organization with a view to maintaining and possibly increasing your customer base.
Typical Measures: Net Flow, Net Interest Margin
Typical Dimensions: Interest Type, Measurement Currency

Involved Party Exposure - To determine the likelihood that an Involved Party, such as a customer, counterparty or supplier, will not support a loan or make a payment according to the agreed conditions; and the degree to which the Financial Institution is at risk in this situation.

Liquidity Risk Analysis - To analyze the uncertainty surrounding the extent of convertibility of assets and the speed of their conversion to cash. In the event of total non-recoverability of the debt to the individual the financial services organization will try and recovers its exposure from the assets put up a surety against the original loan. It is important to make sure that the asset is a saleable commodity, that the asset value does not go down below that of the loan during the repayment period and also that the lien on the loan or the order of priority on who recovers their exposure from that asset is not more than the value of the immediate sale. The face value of the asset is not to be taken as the actual amount recovered as the sale of the article may be sold 'at best' price in order to recover the money in the shortest time possible.
Typical Measures: Number of Policy Exceptions, Net Flow
Typical Dimensions: Resource Item Liquidity, Arrangement Commitment Term

Liquidity Risk Drivers - To do scenario analysis of liquidity risk, and which stress tests should shock in order to reveal the potential consequences of extreme events on an institution's liquidity position. Each driver must be stressed under each of the stress scenarios to reveal how they will be affected and the level of outflows that will occur as a result of the various stresses, and the institution must assess its ability to withstand the outflows given its liquidity resources.

Liquidity Risk Monitoring - To do scenario analysis of liquidity risk, and which stress tests should shock in order to reveal the potential consequences of extreme events on an institution's liquidity position. Each driver must be stressed under each of the stress scenarios to reveal how they will be affected and the level of outflows that will occur as a result of the various stresses, and the institution must assess its ability to withstand the outflows given its liquidity resources.

Liquidity Risk Regulatory Standards - To report standards for supervisors to use in liquidity risk supervision.

Location Exposure - To determine the likelihood that within a given Geographic Area (such as a City, State, Region or Country) that loans and payments will not be supported according to the agreed conditions; and the degree to which the financial services organization is at risk in this situation. This may be due to the exposure of the area to events such as currency devaluation or natural disasters, etc. The judgment of the financial services organization on whether to accept the risk of the loan is based upon the trends of repayments of loans to other individuals from the same location. This will include taking into account the asset value of the surety, the rate of employment, the bankruptcy state and the Location risk rating based upon aspects such as theft, violence and unrest. The financial services organization will assess the risk and either endorse it with certain extra provisions such as higher interest rates, shorter repayment times, smaller maximum loan amounts, higher surety values etc.
Typical Measures: Number of Non Performing Accounts, Average Duration of Non Performance
Typical Dimensions: Household Annual Income Segment, Geographic Area

Market Risk Capital Charges Analysis - The proposed reporting schedule would collect information on reporting entities' value-at-risk measures, specific risk charges and market risk exposures that pertain to the regulatory capital requirements for market risk under the federal banking agencies' proposed revisions to their existing market risk capital framework.
Typical Measures: Standardized Specific Risk Charge, Specific Risk Add-on
Typical Dimensions: Covered Position Type, Financial Market Instrument Type

Market Risk VaR Analysis - To report the Value At Risk (VAR) of portfolios held across the financial institution.
Typical Measures: Commodity Risk VaR Amount, Equity Risk VaR Amount
Typical Dimensions: Market Risk Management Type, Market Risk Portfolio

Non Performing Loan Analysis - To identify the characteristics of loans that are not being repaid or supported according to their agreed conditions. To reduce the risk by the financial services organization to loss due to non repayment of loans there is a need not just to identify the trends of the individuals who fail to make their loan repayments but also to review all the non-performing loans and identify what trends there may be with regards to individual types or location demographics or assets being used as surety etc.
Typical Measures: Average Credit Score, Total Amount Over Limit
Typical Dimensions: Security Appraisal Age Segment, Arrangement Time to Maturity Segment

Operational Risk Assessment - To analyze the financial services organization's operational risks, the types or causes of the operational risks and the amount of regulatory capital required to provide liquidity for the financial services organization against the effect of the operational risks. The financial services organization must take into consideration the possibility of constant operational risk. In addition to the risk involved in extending credit to customers or market factors affecting banking business, the bank also faces the possibility of loss due to operational risks such as legal, system, reputation, etc. For the purposes of calculating regulatory capital requirements, the bank must reserve a set amount of capital to cover the event of operational risk. This amount may be fixed or varied depending on the particular line of business, as certain areas of the business may be more susceptible to particular types of operational risk.
Typical Measures: Standardized Operational Risk Regulatory Capital Amount, Operational Risk Charge Before Capital Reduction
Typical Dimensions: Line Of Business Reporting Group, Financial Institution Group Reporting Structure

Operational Risk Loss Analysis - To analyze the financial services organization's operational risk loss events, the total exposure, loss insurance amounts, write-offs and other adjustments to determine the actual impact on the financial services organization's capital. In the determination of Operational Risk capital requirements, a financial services organization must capture and analyze events that resulted in capital loss. It must be able to identify specific loss events, thresholds beyond which those events become significant and determine where loss amounts have already been factored into credit risk capital requirements.
Typical Measures: Total Adjustment Amount, Recovery Amount, Gross Loss Amount
Typical Dimensions: Loss Event Type, Event Origination Type

Outstandings Analysis - To identify the net position and pattern of the financial services organization in trading products, allowing for unpaid or unsettled situations where the traded product is not held by the financial services organization. Not all loans guaranteed by assets are held by the financial services organization. When making the decision to guarantee a loan the financial services organization has to identify and ensure its position in relation to the priority of repayments made to more than one guarantor of the same surety. If the asset or deed is actually held by the financial services organization then it is more likely to recover its indebtedness immediately than if the surety was held by another financial services organization and you were forced to 'stand in line' for repayment.
Typical Measures: Total Average Value of Customer Debits, Total Debits in Period
Typical Dimensions: Product Type, Exception Cause, Clearing System

Payment Card Fraud Analysis - To analyze the risk associated with fraudulent use of Payment Cards (including, but not restricted to, Credit Cards) that are issued under the terms of the financial institution's Credit Card Arrangement.
Typical Measures: Number Of Payment Card Usages, Number of Mail Stolen Incidents
Typical Dimensions: Card Technology Type, Identity Fraud Identity Information

Portfolio Credit Exposure - To evaluate the likelihood a credit Portfolio will not be supported (loans or payments) according to the agreed conditions; and the degree to which the financial services organization is at risk in this situation. An individual may take out a single loan and put in place an asset to stand as surety. They may increase this loan with a series of other loans and indebtedness against which the same asset or further assets are provided as surety. Each individual loan may score an acceptable risk rate however it is important to be able to review the total indebtedness of an individual or body against their total surety. It is not always prudent to just keep 'adding' to the total portfolio of loans but sometimes to re-structure the total loan portfolio against surety. Sometimes this may work out in favour of reduced interest rates to the customer, other times it might mean the financial services organization is aware that its risk exposure is too high and call in some of the outstanding debts.
Typical Measures: Portfolio Value, Portfolio Beta Risk Index, Credit Exposure
Typical Dimensions: Customer Net Worth, Asset Type, Measurement Currency

Product Risk Analysis - To report on the key risk factors associated with Products such as Financial Market Instruments.
Typical Measures: Convexity, Price Earnings (PE) Ratio
Typical Dimensions: Product Type, Exposure Currency

Securitization Analysis - To analyze the securitization exposures of the financial services organization, in accordance with the guidance for Pillar 3 - Market Discipline in The New Basel Capital Accord from the Basel Committee for Banking Supervision, Bank for International Settlements. In the control and management of financial risk, a financial services organization needs to report on their risk position with regard to their securitization exposures. An Asset Securitization arrangement is where an originator transfers a group of its risk assets (e.g. Credit Card Receivables or Mortgages) to another party, normally a separate legal entity termed a Special Purpose Entity (SPE). Depending on the role of the financial services organization in the securitization, it needs to identify the amount securitized and the resulting exposure amount as the originator of the securitized exposure is permitted to remove the capital requirements for the transferred assets from its overall capital requirement.
Typical Measures: Total Amount Of Securitization Exposures Retained, Excess Spread
Typical Dimensions: Securitization Type, Bank Securitization Role

Securitization Detail Analysis - To analyze the detail of Securitization Exposures subject to the Ratings-Based or Internal Assessment Approaches.
Typical Measures: Total SFA Exposure Amount, Tot Synthetic Scrtzs Esrs Deduction
Typical Dimensions: Time Period, Securitization Approach Type

Security Analysis - To analyze the effectiveness of resource items or contractual obligations that have or will be used to mitigate potential or actual credit risk by or for obligors. This is done by monitoring the monetary amounts involved and determining the potential for the financial services organization to realize funds from the credit risk mitigation provided. The value of an asset is not always the amount able to be realized from it by the financial services organization in times of need. The asset itself may devalue during the period of the loan and the financial services organization needs to keep aware of the value and nature of the surety in relation to the changing trends of the market place. E.g. Endowment policies were thought to be adequate asset value against mortgages but this has now been found not to be the case and people are expected to provide additional assets as 'lien' or surety to the original loan. The sale of an asset may provide the necessary surety if given the time and conditions in which to find the right buyer however if a loan is to be redeemed early then time is usually not a factor that is important and so the asset is sold for a much as it can realize in the shortest time possible. The analysis has to take this into account when agreeing to take an asset as surety. E.g. Most paintings by well known artists keep increasing in value and will always find ready buyers however shares in stocks can be very volatile and the value will change depending on many market factors.
Typical Measures: Total Collateral Valuation, Adjusted Collateral Valuation
Typical Dimensions: Resource Item Value Segment, Lien Position, Security Coverage Type

Value At Risk Analysis - To report the Value At Risk (VAR) and Mark To Market (MTM) of portfolios held across the financial institution.
Typical Measures: Market Value At Risk, Mean Incremental Risk Capital Charge
Typical Dimensions: Value At Risk Confidence Level, Value At Risk Model Type

Wealth Management

Asset Allocation Analysis - To support the financial institution in the analysis of the allocation of assets in a portfolio based on dimension values chosen.
Typical Measures: Portfolio Final Market Value, Portfolio Return
Typical Dimensions: Time Period, Portfolio

Client Profitability Analysis - To support the financial institution in the analysis of the profitability of wealth management clients (i.e. not institutional clients / retail banking customers) based on dimension values chosen.
Typical Measures: Total Cost of Financial Advice, Derived Net Profit
Typical Dimensions: Time Period, Asset Class

Client Summary Analysis - To support the financial institution in the analysis of the investment details of wealth management clients (i.e. not institutional clients / retail banking customers) based on dimension values chosen.
Typical Measures: Total Client Assets, Total Client Taxable Assets
Typical Dimensions: Time Period, Asset Class

Portfolio Fee And Tax Analysis - Portfolio Fee And Tax Analysis provides an analysis of all fees levied and all taxes due and applied.
Typical Measures: Tax Expense, Fee Income
Typical Dimensions: Transaction Fee, Customer

Portfolio Gains Analysis - Portfolio Gains Analysis provides an analysis of gains and losses based on activity for Portfolios in a specified period.
Typical Measures: Portfolio Ending Period Balance, Ending Cash Balance
Typical Dimensions: Asset Class, Financial Market Instrument

Portfolio Performance Analysis - To support the financial institution in the analysis of portfolio performance (i.e. returns) versus benchmark performance.
Typical Measures: Portfolio Final Market Value, Excess Return
Typical Dimensions: Time Period, Portfolio Type

Portfolio Risk Analysis - To support the financial institution in the analysis of portfolio risk based on dimension values chosen.
Typical Measures: Portfolio Final Market Value, Benchmark Return
Typical Dimensions: Time Period, Benchmark

Profit and Loss Attribution Analysis - To support the financial institution in the analysis of profit and loss attribution in a portfolio based on dimension values chosen.
Typical Measures: Portfolio Final Market Value, Benchmark Return
Typical Dimensions: Time Period, Profit & Loss Contribution

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