

IBM Analytics

IBM Banking & Financial Markets Data Warehouse

General Information Manual

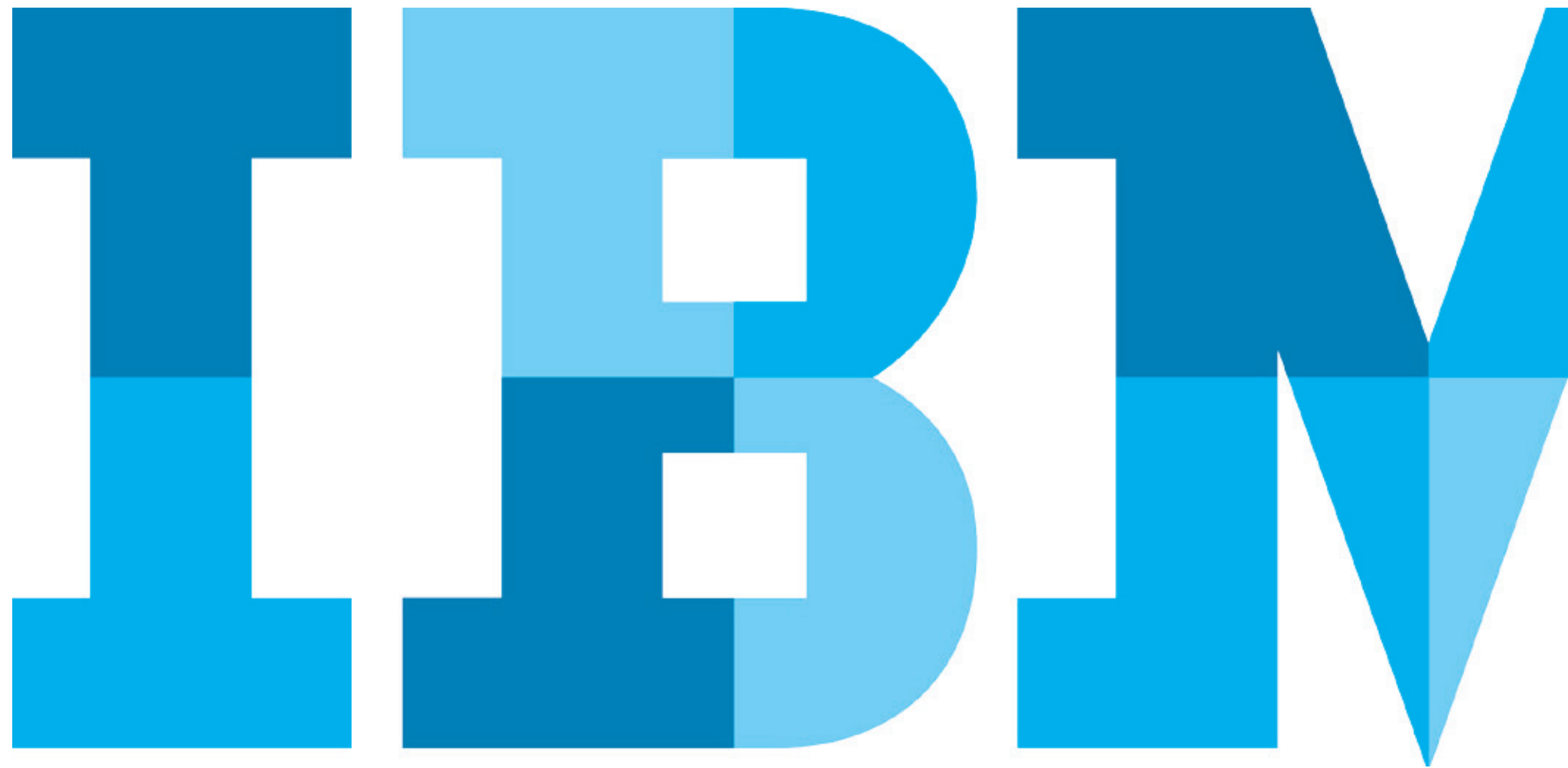


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Executive Summary

IBM® Banking & Financial Markets Data Warehouse (BFMDW) is a family of business and technical models that accelerate the design of enterprise vocabularies, data warehouses, data lakes, and analytics solutions, driven by financial-services-centered business requirements.

Making better decisions faster can make the difference between surviving and thriving in an increasingly competitive marketplace. The financial services industry needs to respond to challenges such as globalization, deregulation and customer expectations.

Aggressive competition, mergers and acquisitions, product and market innovation, restructuring and the need to re-engineer outmoded legacy systems apply additional pressures.

At the same time, organizations need to manage risk and comply with the requirements of new directives and regulatory demands, such as CCAR, FR Y-14M, GDPR¹, Basel II/III, FATCA, Dodd Frank, and Anti-Money Laundering (AML).

The problem is not the amount of data available to the organization, but rather the consistency, accuracy, timeliness and complexity of it. In the past, organizations relied on decision support systems, executive information systems and management information systems to make informed decisions.

These systems typically download data from a number of sources, ran specialized programs against data to reconstruct it in a usable format, and then allowed users to run queries against the data.

central repository, a data warehouse or data lake. This will hold 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.

BFMDW has the flexibility to create a range of data solutions from business analytics focused data marts to enterprise-wide data warehouses, data lakes, and enterprise vocabularies. It acts as an accelerator towards the implementation of solutions in a variety of business areas. It is flexible enough to adapt to the differing needs of individual organizations and can be extended and customized to keep up to date with changes to requirements, for example as industry regulations evolve.



Use Cases

Data Privacy and Protection - GDPR

BFMDW supports the General Data Protection Regulation¹ (GDPR) and provides an industry-specific vocabulary, that can help you discover and govern privacy data, and KPI templates for regulatory reporting. It can help organizations ensure that their enterprise data architecture is able to provide the necessary data artifacts to report on data protection issues and can help to determine and define which personal data types your business uses.

Data Privacy and Protection – CCPA

BFMDW has been updated to support the California Consumer Privacy Act (CCPA) and provides an industry specific vocabulary, that can help you understand requirements for privacy data. Building on the foundations put in place with GDPR, CCPA identifies the key terms within the regulation which are then mapped to the Business Terms. The coverage can help you understand what components to be considered including consumer rights, personal data types, processing activities, processing purposes, and roles.

CCAR

As part of the Federal Reserve disclosure requirements in support of the Comprehensive Capital Analysis & Review (CCAR), significant Bank Holding Companies and Intermediate Holding Companies are obligated to file a quantitative assessment of their portfolios as defined in the reporting form FR Y-14M.

BFMDW contains data structure designs which focus on the monthly disclosures for capital adequacy assessment as defined in FR Y-14M of loan and portfolio data for first and second lien loans, credit card portfolios and address matching data.

ALM and Liquidity Risk

Organizations need to understand the marketability of their investments and the impact this may have when managing and balancing assets and cashflows against financial obligations. In order to satisfy supervisory reporting requirements, including BASEL LCR, US Federal Reserve LCR, APRA LCR, Basel NSFR, COREP Liquidity Reporting, BCBS

239 governance, etc., organizations need to gather detailed and comprehensive information from across their enterprise. They need a business metadata governance model that can describe and consolidate the definition of this diverse information.

BFMDW includes terms that describe the detailed characteristics of the financial information required as core input to ALM and Liquidity Risk calculations. It helps organizations map their diverse source data to a common enterprise reference model.

BFMDW also includes a parallel set of terms describing the products and attributes required for Algorithmic's Algo One Balance Sheet Risk Management data mart terms required for ALM and Liquidity Risk. These terms are mapped to the BFMDW vocabulary, providing users with the ability to streamline their enterprise glossary to the set of mandatory information required in ALM, Amortization/Prepayment, Earnings, FTP and Liquidity calculations.

FIBO

As well as support for FIBO Business Entities, BFMDW includes support for FIBO Foundations specification, which details the core set of business concepts which is common to all organizations within the scope of FIBO and as a foundation of generalized concepts to support the more specific financial industry terms described in the other FIBO specifications.

Data Classes

A Data Class contains information that describes the types of values or characteristics of a piece of information. It is used by IBM Information Analyzer to help classify the type of data it finds in a data source. BFMDW Supportive Content for Algorithmics and ISO20022 v2018 contains sets of values that describe types of data. A Data Class Generator tool was created to encapsulate this BFMDW Supportive Content information into Data Classes that IBM Information Analyzer can use for analyzing data sources. When the Data Classes are generated, they contain mappings back to the BFMDW Business Terms so a full mapping lineage can be maintained.

Industry led governance

While a business vocabulary is often defined as a way to provide a business view to connect with more technical artifacts, or as the starting point for defining the business scope to be used to guide the identification of a subset of logical model elements, the business vocabulary has significant value in its own right. A properly defined business vocabulary that reflects the needs and terminology of the various users can be used to:

- act as a common language across the different business users across the organization
- provide a reference point when aligning new or acquired businesses into the overall organization
- provide a basis for the identification of gaps and overlaps between different projects or activities that the enterprise may be engaged in

BFMDW contains comprehensive enterprise vocabulary data structure designs.

Data Lake

The data lake has emerged as the recognized mechanism to enable organizations to define, manage and govern the use of various big data technologies. This represents an evolution of big data towards mainstream use in an enterprise and the associated focus on management of such assets. Many of the same traditional imperatives for the use of BFMDW also exist when organizations deploy a data lake

- the need to establish a common cross enterprise set of assets for use by the business
- the need to ensure a common understanding of such assets by the business and technical users
- the need to enforce a common governance layer around the data lake

BFMDW contains a number of components which are ideally suited to supporting deployment to a data lake architecture.

Data Warehousing and Marts

A data warehouse is a central repository of summarized data from disparate internal operational systems and external sources. Data organized around business entities such as customer, product or geographical region is more useful for analysis than data committed to applications that support vertical functions of the business.

It 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. BFMDW contains comprehensive data designs for creating atomic and dimensional enterprise data warehouses.

Product Overview

BFMDW provides a blueprint for understanding the information that flows around a financial organization, for governing that information, and for building comprehensive data solutions. It provides a robust set of business and technical data models, which are extensible and scalable so that they can fit an organization's unique environment and offer significant competitive advantage.

Strategic and operational leaders need reliable and accessible information to prioritize and allocate funding, resources, and technology to remain competitive. They are challenged to aggregate the data they need to make key business and operational decisions to improve performance across complex environments.

But for many organizations this information is not easily accessible. While there is no shortage of data, it is often spread across numerous information silos and in multiple formats, making it nearly impossible to turn this information into the type of actionable insight that can drive competitive differentiation.

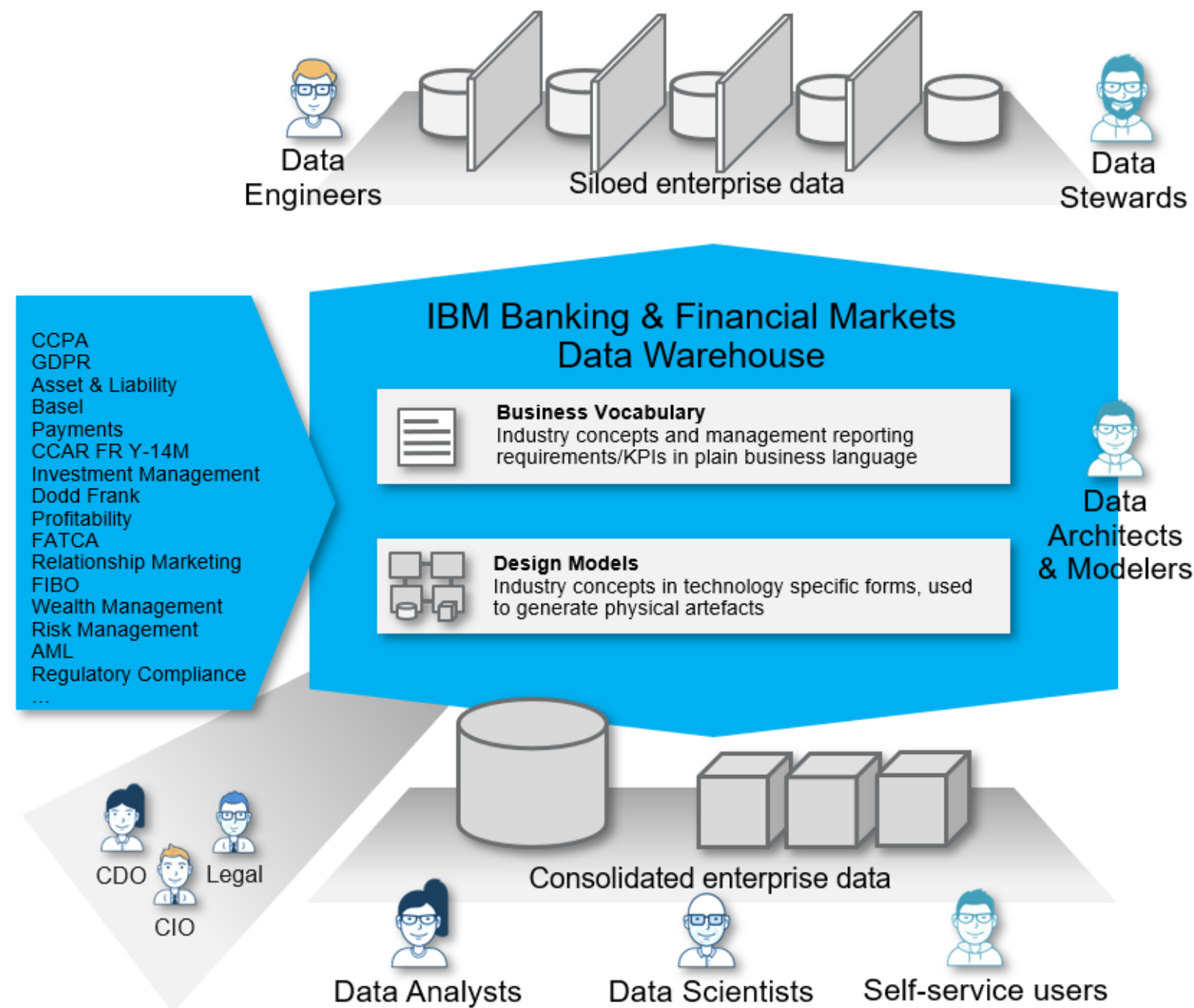


Figure 1. BFMDW solution overview

Most organizations do not have a detailed roadmap showing how to bridge the gap between operational and financial data. They lack the cross-functional expertise, resources and processes to design a comprehensive foundation for business intelligence. Attempting to develop this themselves is expensive and is unlikely to yield results within the necessary timelines for regulatory compliance and business goals.

Packaged business intelligence solutions may not support technology investments already made, and may require an application specific and rigid data model.

Many organizations have outgrown the functionality and effectiveness of their current systems, and cannot achieve the level of data analytics capabilities necessary to understand fully the broad range of activities conducted by its consumers and operations.

What is needed to meet these demands are innovative solutions that can provide the foundation for a broad range of query-based and near real-time business intelligence activities that can effectively integrate and analyze information from a wide range of data sources. The foundation needs to be robust enough to support current needs and extensible and scalable enough to support future requirements that may still be unknown.

BFMDW offers the ability to create an analytical data store that connects to critical data, across disparate systems and formats, across diverse departments and other organizations. It helps build a dynamic analytics environment and forms the foundation of a true data infrastructure where trusted, relevant information is available to the people who need it, when they need it, so that they can make better and timelier decisions.

BFMDW provides a glossary of requirements, terms and concepts that can be clearly understood and communicated by both business and IT professionals, thereby helping to accelerate project scoping, appropriate reporting, data quality and data requirements and identifying sources of data.

Ultimately, it acts as a blueprint by defining a comprehensive map of financial information elements and how those elements interact, as well as the structures necessary to build effective governance assets, and data warehouse and analytics solutions

It provides managers with critical prebuilt reporting templates that offer a wide and deep view of their business through key performance indicators (KPIs) and other measures.

Achieving rapid and successful analytical value requires the proper balance of a comprehensive data structure design, for example across products, customers, accounts, risk and compliance, paired with the ability to support existing models and technologies. Only a flexible model structure developed specifically for the financial services industry can support this.

As a platform independent model, BFMDW is the result of tens of thousands of hours of development effort and deep subject matter expertise, helping business users and IT staff implement an enterprise data warehouse on time and on budget.

BFMDW reaches far beyond simple data gathering. It offers a significant competitive advantage through the ability to continuously process data and transform it into information led business initiatives.

By unlocking information contained in individual applications and repositories from a variety of vendors and making it readily available to the people and processes that need it, BFMDW can help get you closer to a true data architecture.

Solve complex problems requiring complex data

- Turn operational data into strategic insight with end to end integration of your most valuable data
- Build an analytics platform and leverage the investment for years to come
- Track improvements and trends over time with historical views and traceability
- Provide data in a way that enables detailed analysis by business analytics applications
- Leverage existing investments by incorporating existing complex data models into the cross-functional view

Turn insights into action

- Analyze capital structure including ratios, tier 1 and tier 2 capital decomposition by stress test results to determine capital adequacy and help support regulatory disclosure requirements.
- Analyze the risk exposures of the financial institution in order to help determine their risk diversification across industries and identify potential portfolios for restructuring.

- Analyze customers and their communications according to the method of interaction used to determine the patterns in behavior and optimize new offering channels.
- Analyze payment service providers by the type of payment activity commonly used by customers in order to guide the evolution of relevant payment services and products.

Be responsive to your businesses changing needs

- Align business and technical resources with a common target and vocabulary to accelerate progress on your initiatives
- Increase agility and decrease time to deliver new reports to your decision makers with a design optimized for analytics
- Enable department heads with the information they need to be innovative and collaborative
- Adapt to evolving regulatory requirements
- Expand management dashboards and reports to include emerging analytical areas without re-implementing an entire platform

Comprehensive: An integrated model across product, customer, accounts, risk & compliance enabling cross-functional analytics and insights that will drive more informed decisions.

Inclusive: Incorporate existing in-house data models and evolve and innovate as needs expand.

Validated: Validated industry data model establishes a working vocabulary to accelerate business intelligence design across business and technical resources.

Portable: A logical data model decoupled from specific technology, portable across data warehouse systems ensuring enterprise-wide adoption.

Intelligent: Addresses common analytical and reporting requirements such as GDPR¹, CCAR FR Y-14M disclosures and payments analysis.

Collaborative: Provides a gateway between the business language and technical data elements used to deliver your data warehouse, including integration with IBM InfoSphere Information Governance Catalog.

Tailored: Customizable and fully extensible using data modeling tools to tailor the model to your businesses specific requirements.

Trusted: 20+ years of IBM data model design experience supporting more than 500 clients representing large and complex data warehouse and analytics programs.

Reduced Risk: Lower total cost of ownership of platform will minimize risk, project duration and rework.



Components

Business Terms

Business Terms define industry concepts in plain business language, with no modeling or abstraction involved. Clearly defined business terms help standardization and communication within an organization. Mappings to the BFMDW 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 do not model data requirements, but capture the data requirements in a simple structure. Data modeling happens in the subsequent use of the BFMDW data models when the business terms are modeled using inheritance, relationships and attributes.

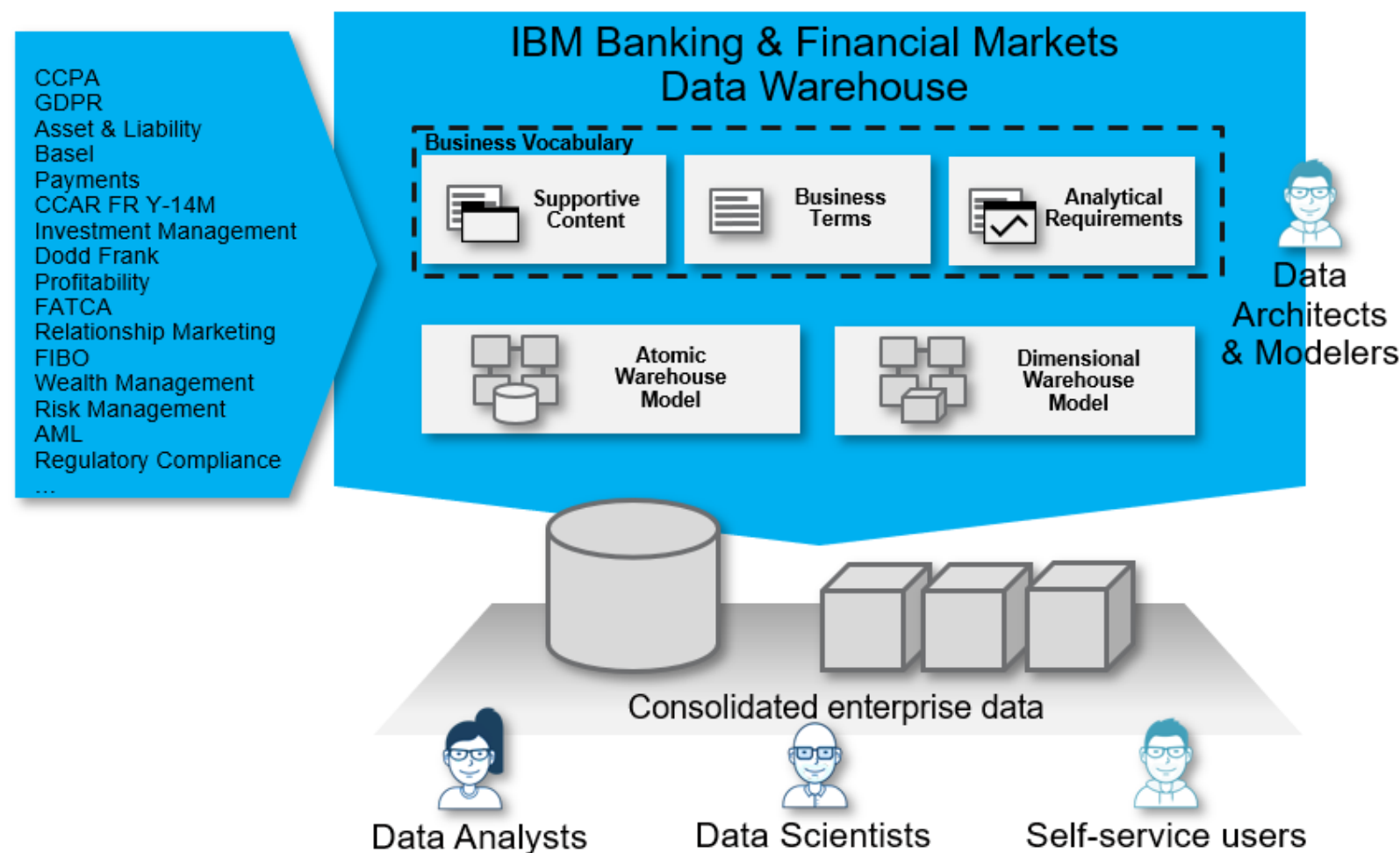


Figure 2. BFMDW solution components

The Business Terms are data-centered and represent the business information requirements of a generic financial services organization, along with the necessary rules to assure information integrity. They provide a framework for the development of consistent, cross-enterprise data structures that promote information sharing across business applications.

They are defined by properties that describe in business language, the meaning of the business term and its status, organized in business categories within a structured hierarchy. Providing a top-down view from an enterprise perspective, they are 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.

They provide organizations with a jump start in the model development process and maximize the value of information. The terms are independent of organizational structure and have been validated by multiple sources within the industry.

The Business Terms represent the business information needs and requirements of the financial services organization using common terms understood by business professionals. They identify high-level data concepts, define the scope of the enterprise and provide 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.

Analytical Requirements

Analytical Requirements reflect the components of the most common queries and analyses for business performance measurement and reporting, while supporting other analytical functions, such as ad hoc reporting and decision support.

Analytical Requirements enable rapid scoping and prototyping of data marts, which provide a subject-specific analytical layer in a data warehouse solution. Business users and analysts can use Analytical Requirements to quickly gather the reporting and analysis requirements of their organization.

Each Analytical Requirement can be divided into measures which are numerical facts that convey quantitative information of importance to the organization and dimensions which then categorize measures.

These measures and dimensions are mapped back to the data warehouse 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 analytics 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.

Supportive Content

Supportive Content provides a method of mapping both external and internal terms from business standards and other requirements to the Business Terms and the Atomic and Dimensional Warehouse Models. This helps business users understand how such business terms are represented in the models, using the naming and definitions of the source.

For example, requirements such as Basel II/III 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.

The purpose of Supportive Content is to capture requirements in a particular domain of interest, and using the language and terminology of that domain and then relate Supportive Content to the Business Terms that define the single language and set of concepts defined by BFMDW. By doing so, the Business Terms can facilitate common communication across multiple regulations and jurisdictions.

As with usage of Analytical Requirements, the user defines the requirements using Supportive Content, which identifies the most appropriate data warehouse structures using the data warehouse model mappings.

Atomic Warehouse Model

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

The Atomic Warehouse Model provides the data design support needed to create a uniform model of the enterprise level business requirements as specific, flexible and efficient structures dedicated to the long-term storage of historical facts.

It provides the content design to support the provision of 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.

It features a flexible Atomic Entity area (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 concepts 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 data model is generated in the initial project phase. Over time, further areas can be generated as the organization tackles more business areas.

The data warehouse model consolidates and itemizes the detailed data structures from many sources.

Dimensional Warehouse Model

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

This repository holds data to meet the needs of business-user-required analyses. Dimensional models are more easily understood by business users.

They are optimized for data querying instead of for transactional speed and their structure means it is easier to extend them to support new data requirements. New queries can be created without having to redesign the data structures, and old queries will still operate without change.

As the enterprise-wide repository for analytical data, the DWM contains star schema style dimensional data structures organized around fact entities that support the Analytical Requirements. Accessed directly through analytical tools or queries, its content can be easily distributed to specific downstream data marts.

Project Scopes

Project Scopes are the method by which business issues are captured within a data warehouse implementation project. A scope 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 Business Terms, Analytical Requirements, Supportive Content and the warehouse models.

Users of BFMDW can create their own project scopes to support their project requirements.

For example, several scopes can be created in the course of a project, each capturing data items added in a particular phase of the 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.

BFMDW is delivered with predefined scopes capturing significant issues likely to be of concern to data warehouse developers. The purpose of these scopes is to aid the scoping and identification of areas of interest across all data warehouse structures.



Deploying BFMDW

BFMDW has the flexibility to create a range of data warehouse solutions from business analytics focused data marts to enterprise-wide data warehouses, data lakes, and enterprise vocabularies.

Data Warehousing

Typically, data structures are not available or accessible to create a broad, innovative data warehouse or analytics 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 customer, 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.
- 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 systems of insights rather than systems of record. Users wishing to gain insight can access many records per transaction, while system of record 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 system of record users constantly update individual records and expect sub-second response times.

A system of insight 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 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:

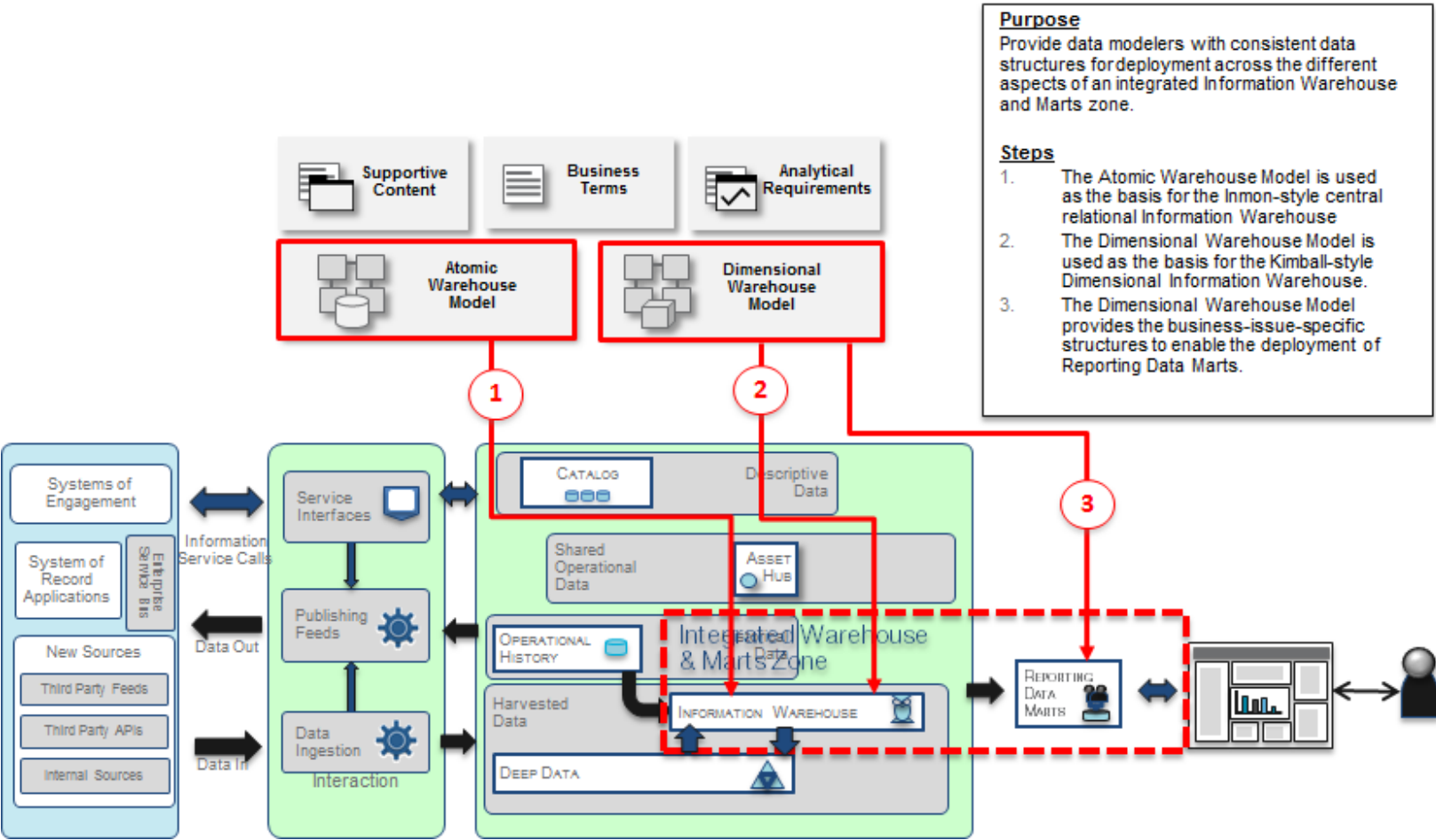


Figure 3. Typical data warehouse architecture

- 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 an infrastructure that is tightly integrated with the logical environment incorporating both the data warehouse model and Analytical Requirements. Organizations can 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 the flexibility to enable users to select their preferred analytical applications for ease of use, preformed reports or complex analytics capabilities.

Data Lake

At the core of the data lake are the set of repositories which could range from traditional RDBMs information warehouses to operational data hubs to HDFS clusters.

The data lake services exist to ensure consistent and controllable access to the data lake as well as ensuring that the appropriate levels of integration/synchronisation are achieved between the data lake repositories and the broader enterprise IT systems.

Underpinning all of this is the necessary middleware called the Information Management and Governance Fabric which oversees all of the provisioning workflows into and across the data lake Repositories as well as providing access control, monitoring and audition capabilities.

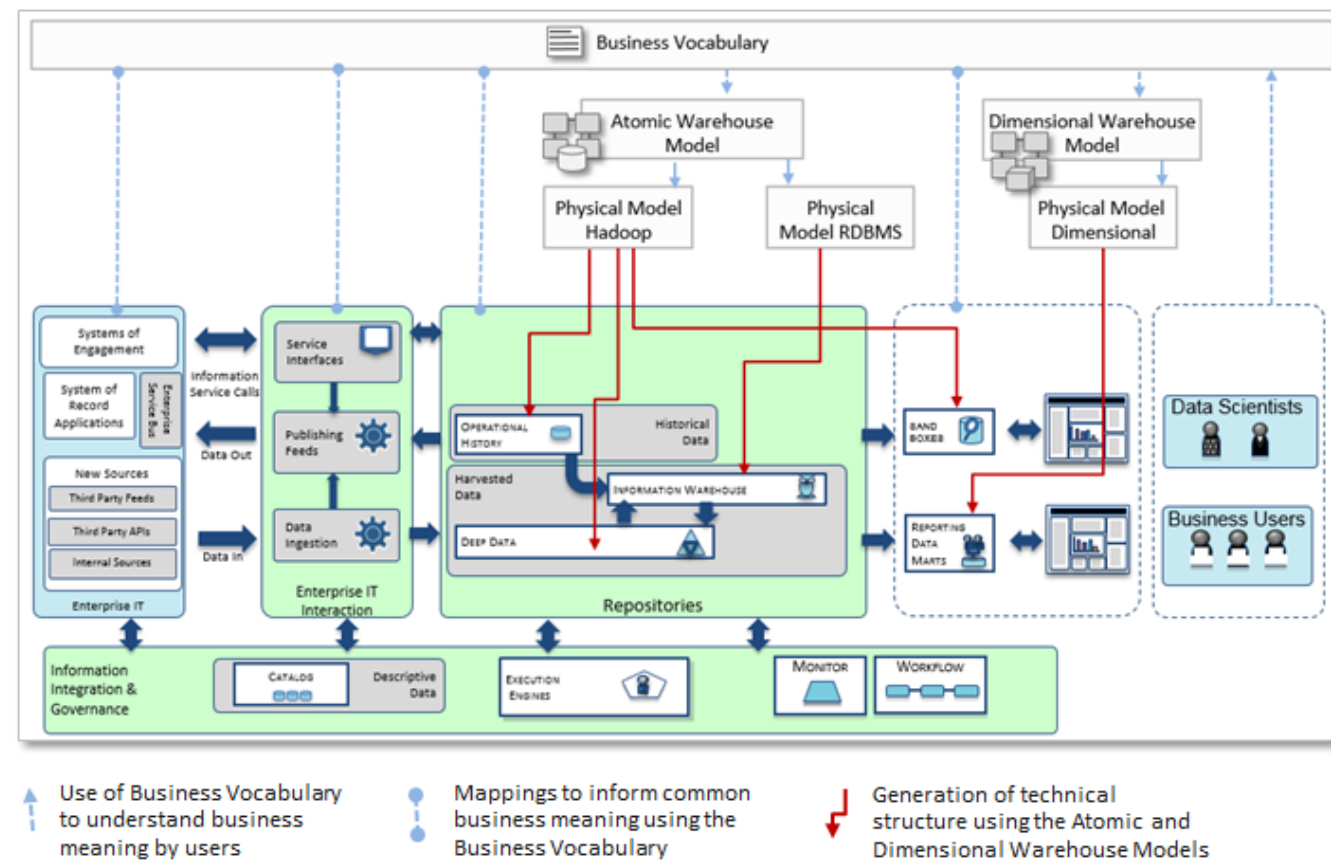
Some of the critical components in relation to BFMDW are:

- Catalog - Business Term content, usually stored in IBM InfoSphere Governance Catalog are deployed into the Catalog component.

- Information Warehouse - The traditional data warehouse is deployed from the Atomic Warehouse Model component.
- Deep Data – This is data in a non-relational repository providing a historical record of the data from the systems of record.
- Reporting Data Marts - The Dimensional Warehouse Model would provide much of the design content for the Reporting Data Marts.

- Asset Hub – The set of near-real-time operational data, typically grouped around data entities such as Customer, Product, Account, etc.
- Sandboxes – A (usually non-relational) store for data for experimentation purposes.

Typically, BFMDW components are design-time artifacts and are used to underpin the related development activities.



- The Business Vocabulary can be used to enforce common business meaning throughout the data lake landscape
- The output of Atomic & Dimensional Warehouse models can be used to define the technical structure of assets in the lake that need to be created

Figure 4. Typical data lake architecture

Catalogs & Vocabularies

Across the typical physical environment for which organizations need to govern with the use of a business vocabulary, there can be a range of different vocabulary elements and grouping corresponding to the range of potentially different users. They have different needs based on their technical knowledge, the scope of the environment they need to see, the frequency of usage and the types of access.

BFMDW provides an accelerator for the creation of this language by providing a predefined language that describes that information that is represented in the data models but is independent of the technical structure of the data models.

The Business Terms typically provides the central enterprise-wide taxonomy of business terms intended for enforcing a common terminology across different IT and Business-focused users. These taxonomies can be large as they are intended to cover all possible aspects of an Industry. So, the typical method assumes that only the appropriate subset of these terms is used for any particular deployment.

The Analytical Requirements comprise high-level reporting information and business measures along the axes of common dimensions. While the Analytical Requirements are primarily designed to allow business users to rapidly map reporting requirements to the data models, they can also be used as the part of a business vocabulary that is focused on supporting calculated values or KPIs.

The Supportive Glossary incorporates terminology that originates from external sources such as regulatory authorities and

industry standard bodies. The terms in these structures are deliberately created to reflect the language that is used in the particular source application or regulation being described.

So, there might be potential value in using such structures as a source of terms if there is a need to define a business users glossary that relates to the area they cover. It is more likely that such structures are most useful when defining a functional view that equates to an area of the regulation that is already described in a particular supportive content structure.

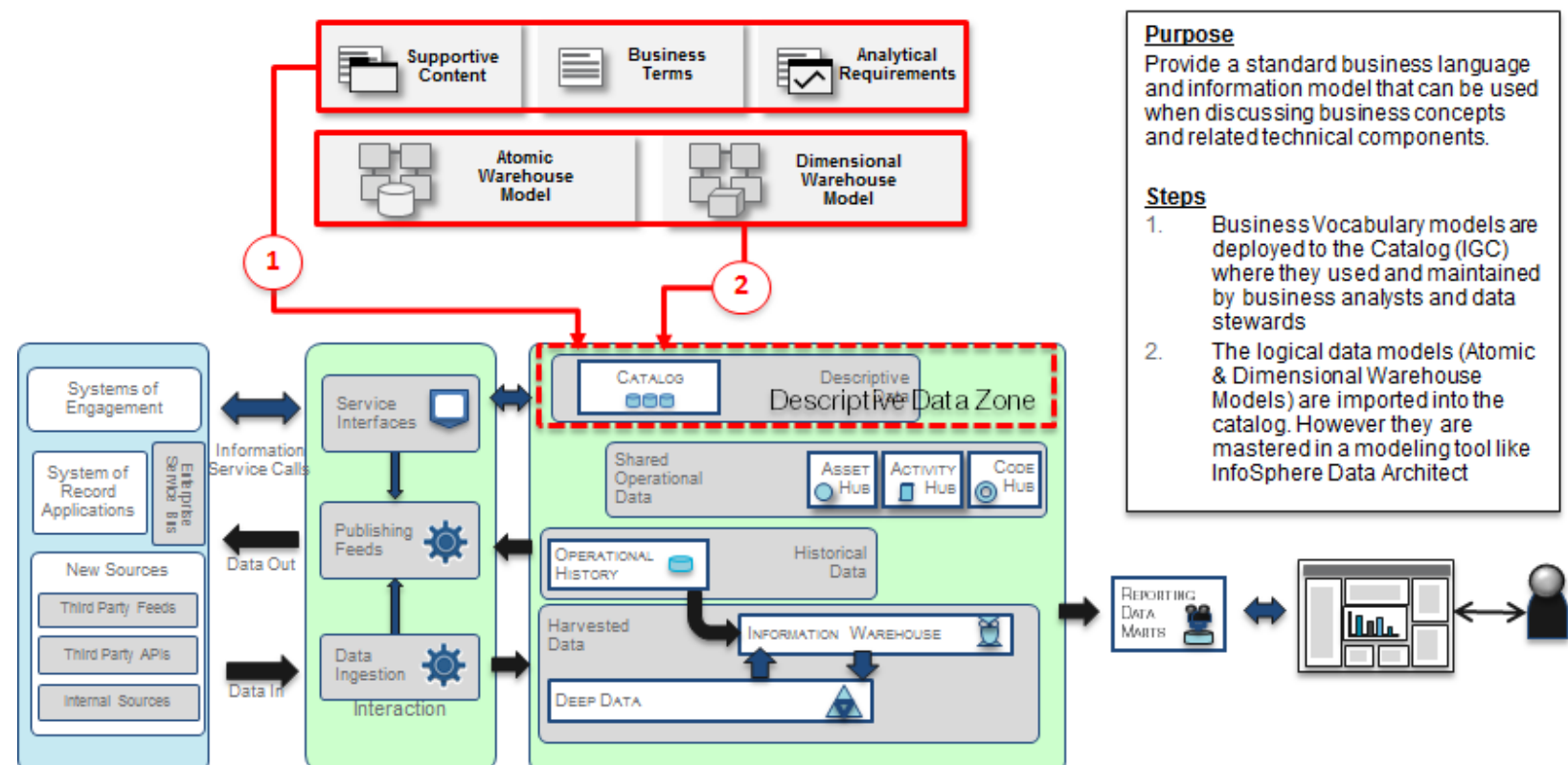


Figure 5. Typical catalog/vocabulary architecture

Business Content

BFMDW is rich in financial services content, which is represented in multiple forms depending on how you want to work with it. This content is easily accessible to business users via the Business Vocabulary components and the Project Scopes and is described later in this section.

The Business Terms contains over 9,500 distinct terms representing components of information from the financial services industry. This extensive set of terms is structured into hierarchies of information to aid navigation of the content.

Reporting requirements are detailed in the Analytical Requirements which highlight 8 major focus areas of the analysis in the business. Each focus area contains a set of templates that group metrics and dimensions by reporting topic.

Supportive Content details non-reporting requirements where external regulatory texts, data application integration parameters and other domain specific terminologies need to be integrated.

Where a subject crosses multiple BFMDW components and leverages off existing, distributed concepts, Project Scopes are used as a method of grouping the content together into project topics for ease of identification to subject matter experts.

This rich business content is used as input to the Atomic and Dimensional Warehouse Models where the business level information is enhanced with technical specifications that describe how the underlying data should be stored and optimized for analysis and reporting.

Business Terms

This set of financial services specific terms is structured into hierarchies of information to aid navigation of the content. These hierarchies are distinguished firstly based on the characteristics of the data into 9 different categories of information:

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.

Each hierarchy of information then divides the terms into whether it describes a type, property or relationships of the information. The information is organized by general broad concept down to specialized information. The result is a vocabulary that provides a highly structured and navigable set of terms describing the financial services business.

Analytical Requirements

Asset and Liability Management

- Capital Allocation Analysis
- Capital Procurement
- Credit Loss Allowance Analysis
- Economic Balance Sheet Analysis
- Equity Position Exposure
- Financial Management Accounting
- Financial Market Transaction Analysis
- Funds Maturity Analysis
- Interest Rate Sensitivity Analysis
- Liquidity Analysis
- Net Interest Margin Variance
- Positions Analysis
- Short Term Funding Management
- Structured Finance Analysis
- VWAP Analysis

Payments

- High Value Outward Payment
- Inward Payments
- Inward Payment Rate Tolerance
- Inward Payment User Activity
- Inward Payments Volume
- Outward Payments
- Payment Card Fraud Analysis
- Payment Card Merchant Analysis
- Payment Origin And Destination
- Payment Limit Exception Analysis
- Payment Service Performance
- Payment Service Provider Analysis
- Payment Service Reliability
- Payment Volume Cost And Revenue

Investment Management

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

Profitability

- Activity Based Costing Analysis
- Business Procedure Performance Measurement
- Channel Profitability
- Customer Lifetime Value Analysis
- Customer Profitability
- Governed Data Cost Analysis
- Income Analysis
- Insurance Product Analysis
- Investment Arrangement Analysis
- Islamic Banking Profitability Analysis
- Location Profitability
- Organization Unit Profitability
- Payment Service Profitability
- Performance Measurement
- Product Analysis
- Product Profitability
- Profitability Analysis
- Transaction Profitability Analysis

Relationship Marketing

- Contact Center Performance Analysis
- Contact Center Usage Analysis
- Campaign Analysis
- Card Fees Analysis
- Card Loyalty Analysis
- Cross Sell Analysis
- Customer Attrition Analysis
- Customer Behavior
- Customer Complaints Analysis
- Customer Delinquency Analysis
- Customer Experience Analysis
- Customer Interaction Analysis
- Customer Investment Profile
- Customer Loyalty
- Data Subject Request Analysis
- Individual Customer Profile
- Lead Analysis
- Market Analysis
- Mobile Visitor Analysis
- Operator Script Performance Analysis
- Social Media Analysis
- Social Media Persona Analysis
- Website Page Analysis
- Wallet Share Analysis
- Website Visitor Analysis

Wealth Management

- Asset Allocation Analysis
- Client Profitability Analysis
- Client Summary Analysis
- Portfolio Fee And Tax Analysis
- Portfolio Gains Analysis
- Portfolio Performance Analysis
- Portfolio Risk Analysis
- Profit & Loss Attribution Analysis

Risk Management

- 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
- Data Breach Analysis
- Data Protection Impact Assessment Analysis
- Debt Restructure Analysis
- Economic Capital Analysis
- Equity Exposure Analysis
- Incremental Risk In The Trading Book
- Individual Credit Assessment Analysis
- Insurance Risk Profile
- Interest Rate Risk Analysis
- Integrated Risk Analysis
- Involved Party Exposure
- Liquidity Risk Analysis
- Liquidity Risk Drivers
- Liquidity Risk Monitoring
- Liquidity Risk Regulatory Stds
- Location Exposure
- Market Risk Capital Charges Analysis
- Market Risk VaR Analysis
- Non Performing Loan Analysis
- Operational Risk Assessment
- Operational Risk Loss Analysis
- Outstandings Analysis
- Portfolio Credit Exposure
- Product Risk Analysis
- Securitization Analysis

- Securitization Detail Analysis
- Security Analysis
- Short Term Liquidity Analysis
- Value At Risk Analysis

Regulatory Compliance

- Best Execution Analysis
- Capital Adequacy Analysis
- Continuous Auction Analysis
- Data Subject Consent Analysis
- ECB Reporting
- FATCA Compliance Analysis
- FATCA Implementation Analysis
- FATCA Withholding Analysis
- Financial Capital Adequacy Analysis
- Foreign Financial Account Analysis
- Periodic Auction Analysis
- Quarterly Transaction Reporting Analysis
- Quote Driven Analysis
- Remuneration Analysis
- Structure of Regulatory Capital
- Suspicious Activity Analysis
- Trader Transaction Analysis
- Transaction Activity Analysis
- Transaction Reporting Analysis
- Variable Remuneration Analysis

Supportive Content**CCPA**

- CCPA Document Sections
- CCPA Document Terms
- CCPA Term Groups
 - Consumer Rights
 - Personal Data
 - Processing activities
 - Processing purposes
 - Related Terms
 - Roles

GPDR

- Chapters
- Personal data
- Processing activities
- Purposes of processing
- Rights of data subjects
- Roles

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 Requirement
- Probability Of Default (PD)
- Securitization Framework
- The First Pillar - Minimum Capital Requirements

- Market Risk Capital Requirement
- Credit Risk - Internal Ratings Based (IRB)
- Counterparty Credit Risk
- Global Capital Framework

CCAR

- FR Y-14M

Dodd Frank

- Swap Data Reporting Requirements
- Large Trader Reporting
- Retail Foreign Exchange Transactions
- Further Definition of “Swap,” “Security-Based Swap,” and “Security-Based Swap Agreement”; Mixed Swaps; Security-Based Swap Agreement Recordkeeping
- Further Definition of “Swap Dealer,” “Security-Based Swap Dealer,” “Major Swap Participant,” “Major Security-Based Swap Participant” and “Eligible Contract Participant”

EBA’s Data Point Model

- Dimension
- Dimension Coordinate
- Domain
- Hierarchy
- Member
- Reporting Framework
- Table Version
- Table Version Azis
- Table Version Azis Ordinate
- Taxonomy

FATCA

- FATCA US Taxpayer Compliance
- FATCA Foreign Financial Institution Compliance
- FATCA U.S. Withholding Agent Compliance

- FATCA Inter Governmental Agreements

Financial Markets

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

FIBO

- Business Entities
- Foundations

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

- ISO 20022 Financial Services - Support for Payments and Securities business domains.
- Legal Entity Identifier (LEI) - Identifies the common data elements required for the administration of a common system of entity identification to be used in monitoring and managing systemic risks.

- 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.
- IBM Financial Transaction Manager (FTM) - identifies the data items required for FTM support.

Project Scopes

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

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
- By Sector or Counter-party Type
- Capital Adequacy
- Capital Adequacy Disclosure IMA
- Capital Adequacy Disclosure STD
- Capital Structure
- Counter-party Credit Risk
- Credit Risk Exposure Detail
- Credit Risk IRB
- Credit Risk IRB Equity
- Credit Risk IRB Retail
- Credit Risk Losses IRB
- Credit Risk Losses IRB Advanced

- Credit Risk Mitigation
- Credit Risk Portfolio IRB
- Credit Risk Portfolio STD
- Equity Disclosure Banking Book
- Geographic Breakdown
- Impaired Loan and Allowance
- Interest Rate Risk Banking Book
- Maturity Breakdown
- Operational Risk Basic
- Operational Risk Standardized
- Scope of the Application
- Securitization Disclosure
- Securitization Early Amortization

Basel III Project

The Basel III project scopes capture important aspects relating to Basel III.

- Basel III Backtesting CCR Models
- Basel III Liquidity Risk Management Framework
- Basel III Liquidity Risk Regulatory Standards
- Basel III The Global Capital Framework
- Basel III Global Systemic Important Banks
- Basel III Liquidity Risk Monitoring
- Basel III Regulatory Standards LCR

Anti-Money Laundering

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

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

Customer Centricity

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

Other

- Foreign Account Tax Compliance (FATCA)
- FFIEC 101 and 102
- FIBO
- Financial Markets Instrument Hierarchy
- KPI Executive, Operations, Risk, Sales Manager Dashboard
- MISMO eMortgage
- Insurance Product Analysis
- Insurance Risk Profile
- Investment Arrangement Analysis
- Payments Analysis
- Payment Cards
- Social Media
- Structured Finance Analysis
- Scorecarding
- VaR For Trading Activities Report
- Wealth Management
- Wholesale Credit Exposure Report



Business Content in Detail

content in the Analytical Requirements in further detail.

Asset & 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

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.

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.

Economic Balance Sheet Analysis - Balance Sheet Analysis records the current asset and liability positions in a financial institutions Balance Sheet.

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.

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.

Financial Market Transaction Analysis - To analyze a group of financial market transactions for the purposes of reporting to management or clients.

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.

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.

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.

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.

Positions Analysis - To analyze and report the trading positions held by the financial institution.

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.

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.

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.

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.

Corporate Action Analysis - To support the financial institution in the analysis of the effect of Corporate Actions upon investment funds and investment plans.

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.

Financial Market Lot Analysis - Supports the analysis of Financial Market Lots.

Foreign Exchange Analysis - Supports the analysis of Foreign Exchange transactions in respect of Investment Funds.

Holding Movement Analysis - This Analytical

Requirement supports the analysis of Investment Fund holding movements.

Investment Fund Analysis - To support the basic analysis of activity in Investment Funds.

Performance Analysis - To support the financial institution in the analysis of investment fund and plan performance.

Performance Versus Benchmark Analysis - To support the financial institution in the analysis of investment fund and plan performance compared to benchmarks.

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.

Securities Available For Lending - This Analytical Requirement supports the analysis of securities lending.

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.

Profitability

Activity Based Costing Analysis - To determine how the costs and income received by the financial services organization are being cross charged between the different Profit Centers, and thereby help to determine an accurate income and cost allocation algorithm. The costs and income are cross charged in relation to the type of the Activity occurring. Financial services organizations need to know they operate in the most efficient and effective way. To do this these costs must be transparent. Transparency is achieved by correctly apportioning costs to Products and Services. Traditional systems distort these costs, as they do not allow for the

diverse ranges of products and services, which differ in both volume and complexity. ABC actually relates costs to 'individual' products and services rather than grouping them all together. ABC focuses the management of the operational costs on the underlying causes of the cost at a root level. To reduce costs and improve revenue and therefore the efficiency and effectiveness of organizations, you can now begin to improve the processes which carry out these activities by looking at the costs at the component level of each activity. The Measures and Deliverables associated with this can record the information of costs at the 'Direct Costing' level and the 'Indirect Costing' level. It can record the 'Number of Transactions' and individual product costs and total costs for groups of specific types of Products and Services. It can record the 'Source Allocation' and 'Destination Allocation' centers in order to see how the costs and incomes are cross-charged among different Profit Centers and it also is able to record the 'Allocation reasons' and 'types'. This ensures that information regarding the activities surrounding the Products and Services are captured at an individual level and component level rather than grouping the costing for Products and Services when they can differ in both volume and complexity.

However this does demand a 'rigor' on the part of the customer who must be able to accurately record and measure in their source system (GL), the costs of the constituent parts of each broken down activity which relates to the Products and Services. This information will then be able to be extracted and loaded into BFMDW in the relevant locations in order to effect detailed Management reporting on the Activity Based Costing of individual or groupings of Products and Services.

Business Procedure Performance Measurement - To identify the effectiveness and pattern of performing business procedures against benchmarks set by peers, such as comparable organizations and organization units. By keeping track of competitors business processes and procedures and setting targets of excellence you can improve your own

processes and procedures in order to exceed those levels set by your competitors.

Channel Profitability - To identify the contribution to profit of the financial services organization's channels, including branch networks, agencies, correspondents and electronic channels. Keeps control on costs of the various methods of communication and delivery mechanisms used in the financial services organization. Enables a view to be taken on the cost of using a process in the financial services organization or using a lower costing equivalent by renting or using another services organization's process.

Customer Lifetime Value Analysis - To evaluate the total projected earnings of a customer to the financial services organization over the probable lifetime of that customer. This enables you to project the potential for purchases by the customer of additional products or higher value products already owned during the time that customer is with the financial services organization.

Customer Profitability - To evaluate the contribution to profit of the customers of the financial services organization. This profit contribution by customers can be selected by various different characteristics of the customer base E.g. where the customers resides; how much they earn; age groupings of customers etc.

Governed Data Cost Analysis - To analyze the actual versus expected costs incurred by the activities associated with accumulating, maintaining and destroying personal data.

Income Analysis - To analyze patterns of interest and non-interest revenues and expenses, including actual, potential and foregone items.

Insurance Product Analysis - To analyze the performance and profitability of Insurance Products in terms of activity counts, premiums received, costs and benefits paid.

Insurance Product Analysis - To analyze the

performance and profitability of Insurance Products in terms of activity counts, premiums received, costs and benefits paid. In order to perform this analysis detail is recorded against aspects such as Number of claims received and accepted; the financial amount of those claims received, accepted or deducted; the average cost of these claims against the number received etc.,

Investment Arrangement Analysis - To analyze Investment Arrangements in terms of activities, turnover, income and cost. Hence to determine the performance of Investment Managers and Investment Products. By keeping details on the Investment Arrangements you can identify those products, which perform better than others and therefore promote those to your customers. This also enables you to identify the quality and accuracy of the advice provided by the Investment Managers to the customers with regards to the purchasing choice of selected Investment Products over others.

Islamic Banking Profitability Analysis - Islamic Banking provides Profitability Analysis specific to Islamic Banking arrangements.

Location Profitability - To identify the contribution to profit of geographic areas served by the financial services organization. The contribution is based upon how much is spent by the customer on the financial services organization's products with regards to their proximity to the financial services organization, to their proximity to competitors and the proximity of the financial services organization to their competitors.

Organization Unit Profitability - To evaluate the contribution to profit of the organization units of the financial services organization. The profitability of the financial services organization is dependant upon the profitability of its individual units or departments of which it is comprised. You can control costs and profit by knowing which units or departments make the most money with the lowest overheads by keeping track of the products and services they deal

in; by their level of responsibility and ownership and also by their geographic location.

Payment Service Profitability - To support the Financial Institution in the analysis of the profitability of payments transactions that are handled by the Financial Institution, based on an evaluation of the volumes, costs and revenue generated. Such measures can be broken down by dimensions such as Payment Transaction Type, originating Channel and Customer to facilitate comparison..

Performance Measurement - To identify the effectiveness and pattern of Organization Units business performance against benchmarks set by peers, such as comparable organizations and organization units. By keeping detail on how you perform in relation to your competitors with regards to the gain and loss of customers, the number of complaints received and responses to those complaints, the amount of the financial services organization's assets comprising Loans at risk, enable you to keep in perspective how well or how badly you are doing when relating it to your competitors.

Product Analysis - To define products and services according to their features, facilities and conditions, and to compare them with competitors' products. In order to maintain the edge over your competitors you need to keep track of their products and services and how they compare to your own. Therefore you need to know your products and services down to a more detailed level such as Product costs, interest rates, price etc.

Product Profitability - To evaluate the contribution to profit of the products of the financial services organization. Knowing the details of your products and how much they add to your profit will determine whether you increase profitably lines and decrease costly lines in order to maximize on the financial services organization's revenue and overall profit. To determine the best or worst products you need to track development costs, operational costs and sales costs against the sales of these products and weigh

this up against factors such as location, delivery mechanisms etc.,

Profitability Analysis - To evaluate the various contributions to profit of the financial services organization based on net directly attributable income and expense, allowing for risk, transaction usage and transfer pricing for funds. By keeping information about all the component parts of your products and services regarding where the costs occur and the revenues are generated will enable detailed analysis on the amount of profitability and the reason for the profitability for the financial services organization to occur.

Transaction Profitability Analysis - To enable the transactions that are handled by the financial services organization to be analyzed with a view to evaluating the volumes and cost (to the financial services organization) of such transactions.

Such measures can be broken down by dimensions such as Transaction Type, originating channel and geography to facilitate comparison. By identifying the total amount of transactions handled by the financial services organization and identifying those which make a profit and those which make a loss due to large deductions and smaller profit margins will enable you to increase overall profit by keeping revenue from transactions up but reducing the more costly and less efficient transactions.

Regulatory Compliance

Best Execution 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).

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

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.

Data Subject Consent Analysis - To analyze the Arrangements in place with Individuals (Data Subjects) giving consent for the processing of areas of their personal data for specified purposes.

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.

FATCA Compliance Analysis - To analyze the Financial Institution's accounts in an effort to measure compliance with FATCA regulation post implementation and to identify the volumes and type of accounts impacted most by the compliance rules.

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.,
- identify 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.

FATCA Withholding Analysis - To support the

Financial Institution in the generation of reports and the analysis of payments which are withholdable under IRS FATCA regulation.

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.

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.

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.

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.

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.

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).

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.

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.

Trader Transaction Analysis - Trader Transaction Analysis - To support the Financial Institution in the generation of reports and the analysis of Financial Markets Transaction Activity in relation to Dodd-Frank Large Trader Reporting Rule 13h-1 monitoring and reporting requirements. Also relevant to SEC transaction reporting. The Rule also requires registered broker-dealers to report transactions that equal or exceed the reporting activity level effected by or through such broker-dealer for both identified and Unidentified Large Traders.

Transaction Activity Analysis - To enable the transactions that are handled by the 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 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 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.

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.

Variable 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). 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.

Advanced Risk Based Capital Analysis - To analyze the Risk-Based Capital Numerator and Ratios for Banks and Bank Holding Companies.

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.

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.

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.

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.

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.

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.

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 lose 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.

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.

Data Breach Analysis - To analyze the occurrence and nature of Personal Data Breach events within the Financial Institution. This analysis would allow the Financial Institution to determine trends in the type and frequency of breach events.

Data Protection Impact Assessment Analysis - This business area concerns monitoring and analysis of Internal or external assessments and fail rates that

determines the risk of violation of the privacy rights to individuals when processing their personal data.

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.

Economic Capital Analysis - Economic Capital Comparison Analysis compares the different forms of capital with the Economic Capital.

Equity Exposure Analysis - To analyze the detail of Equity Exposures subject to the advanced approaches rules.

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.

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.

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.

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.

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 services organization is at risk in this situation. It is important to know your customers and to know how changes in circumstances can change their expected pattern of behavior. Maintaining and keep track of information about your Involved Parties with regards to exposure with other products, both with yourselves and other financial services organizations and with regards to the characteristics and demographics of the individual concerned all help build up a constantly changing picture of the person to whom the exposure has been made and the ever changing risk of the financial services organization not being able to recover all or part of its indebtedness.

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.

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 report the metrics outlined in this section as consistent monitoring tools. These metrics capture specific information related to a bank's cash flows, balance sheet structure, available unencumbered collateral and certain market indicators.

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.

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.

Market Risk VaR Analysis - To report the Value At

Risk (VAR) of portfolios held across the financial institution.

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.

Operational Risk Assessment - To analyze the organization's operational risks, the types or causes of the operational risks and the amount of regulatory capital required to provide liquidity for the organization against the effect of the operational risks. The 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.

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.

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.

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.

Product Risk Analysis - To report on the key risk

factors associated with Products such as Financial Market Instruments.

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.

Securitization Detail Analysis - To analyze the detail of Securitization Exposures subject to the Ratings-Based or Internal Assessment Approaches.

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 as 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.

Short Term Liquidity Analysis - To promote resiliency over short-term time horizons by creating additional incentives for banks to fund their activities with more stable sources of funding on an ongoing structural basis.

Value At Risk Analysis - To report the Value At Risk (VAR) and Mark To Market (MTM) of portfolios held across the financial institution.

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.

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.

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.

Portfolio Fee And Tax Analysis - Portfolio Fee And

Tax Analysis provides an analysis of all fees levied and all taxes due and applied.

Portfolio Gains Analysis - Portfolio Gains Analysis provides an analysis of gains and losses based on activity for Portfolios in a specified period.

Portfolio Performance Analysis - To support the financial institution in the analysis of portfolio performance (i.e. returns) versus benchmark performance.

Portfolio Risk Analysis - To support the financial institution in the analysis of portfolio risk based on dimension values chosen.

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.

Relationship Marketing

Contact Centre Performance Analysis - To analyze the performance in terms of productivity, efficiency and profitability of call centers operated by or on behalf of the financial institution.

Contact Centre Usage Analysis - To evaluate the Call Centre Usage behavior of customers of the Financial Institution.

Campaign Analysis - To analyze and compare the effectiveness of customer and product promotions, marketing drives and advertising. By keeping track of the costs and effort in promoting a campaign, by recording the responses to advertising and by tracking the increase in revenue by sales of products and services together with any additional customers, you can determine if it is cost effective to hold these campaigns in the future.

Card Fees Analysis - To assess the incomings

and outgoings that the financial institution has in relation to fees and charges for the servicing of card arrangements.

Card Loyalty Analysis - To assess the customer propensity to maintain a long term relationship with the financial institution for card services beyond the introductory special deal offer period.

Cross Sell Analysis - To analyze the characteristics of multi-product usage by customers. Identifying profitable trends usage of a base product suggests complementary product and service purchases. This also allows review of a financial services organization cross-selling plans. By knowing how successful the sale of complimentary products are in regards to revenue and profit will enable you to target those customers already owning or currently purchasing the 'base' product and encourage the sale of further products. For example, a Mortgage product linked with a Life Assurance policy product linked with House Insurance and Contents Insurance products protected by a Mortgage Protection product.

Customer Attrition Analysis - To understand the reason and impact of customers ceasing to use the financial services organization's products and services. By recording the reasons why an existing customers transfers to a competitor and identifying what the financial impact is on revenue and profit, you can improve on your efficiency to prevent further defections and possibly target your old customers back by improving the services and products causing the original defections

Customer Behavior - To understand customer trends and define the lifetime activity patterns of the financial services organization's customers, in order to assess and guide the provision of products and services to the customer community. By knowing about your customers and their characteristics and assessing this information over time will enable you to identify trends and behaviors, which enable you to target specific products and services at selected

target customers in the community.

Customer Complaints Analysis - To understand the pattern of complaints and the effectiveness of the resolution process. By knowing the existing customers complaints and the effectiveness of your resolution process in dealing with them – will enable you to manage your customer base retention by not losing existing customers to the competition.

Customer Delinquency Analysis - Customer Delinquency Analysis analyzes Customers who have at least one Arrangement that has been deemed delinquent, in terms of the length of time for which the delinquencies have occurred and the delinquent amounts outstanding. By knowing which customers have products with outstanding repayments and how long these missed repayments have been outstanding will enable you to identify those customers who have a higher risk association if they apply for other repayment type products.

Customer Experience Analysis - To identify the customer, financial and internal business process measures outlining how the financial institution appears to customers and shareholders i.e. are customer and shareholder needs being satisfied, are the critical internal operations satisfying customer and shareholder needs.

Customer Interaction Analysis - Analysis of how the financial services organization interacts with its customers and the effectiveness of communications and channels in terms of winning new business. The analysis measures active threads of communication.

A Thread is a series of sequential Communications on a given subject. Examples are a Complaint Thread initiated by a Customer or a Product Sales thread initiated by the financial services organization. An active thread is defined as being a thread on which a Communication was sent or received within a given Measurement Period. By knowing and keeping track of the communication process you can assess how much business you gain or how many customers you

may lose by poor communication. E.g. Complaints handling communication initiated by the customer or a Product sales communication handled by the financial services organization.

Customer Investment Profile - To determine profiles of Customer Investment Portfolios in terms of activities, turnover, strategy and objectives. Hence to increase Customer retention and consequent investment-related revenue to the financial services organization by advising Customers on methods of maximizing those Investments in which the financial services organization has an involvement. By knowing your customers investments, you can advise if, when, why or what a customer should be advised to invest their money in with the financial services organization's products and services.

Customer Loyalty - To understand the determination a customer has for continuing to use the services of the financial services organization, while recognizing the customer has alternative choices. By knowing why certain customers stay loyal with the financial services organization and knowing why others leave will enable you to improve those products or services targeted as being the reason for staying or leaving.

Data Subject Request Analysis - To analyze the Data Processing Requests received in relation to the processing of personal data of Individuals (Data Subjects), within a specific time period.

Individual Customer Profile - To identify the demographics of the financial services organization's customer base and compare them with that of the target population and of peer financial services organizations' customer bases. By knowing details per specific individual customers you can target individuals as to their needs based upon these characteristics and by a comparison to other similar individual customers products purchases.

Lead Analysis - To identify prospects for new product and service sales and analyze the effectiveness of this activity. By knowing the characteristics of your customers and the community, new products and services can be potentially sold to this group. The resultant gain in customers and revenue to the financial services organization from these Leads is documented and can be used in future Lead analysis.

Market Analysis - To identify the demographics of a market and the financial services organization's customer base within the market; and compare the results with that of the target population and of peer financial services organizations' customer bases. By identifying details regarding particular trends occurring in the marketplace and also recording your customer base characteristics and preferences, you can identify where new product sales could occur. By collating information on the households of existing customers you can identify potential sales to members of the household who hold competitor products or who have no products at all.

Mobile Visitor Analysis - To analyze the effectiveness and impact of a visit to the financial institution's website using a mobile device by an identifiable unique visitor where the visitor is human.

Operator Script Performance Analysis - To analyze the performance in terms of productivity, efficiency and profitability of call center operators and the scripts they use when dealing with the financial institution's customers.

Social Media Analysis - To analyze the social media activity relating to the financial institution or subject of interest. It looks at measures such as the social media sentiment and the exposure of the social media page.

Social Media Persona Analysis - To analyze a social media persona that is of interest to the Financial Institution. The social media persona could be related to an existing Involved Party that the Financial Institution has on record or may exist

independently of any direct link to another Involved Party. The link to an existing Involved Party can also be made at a future date if the relevant information becomes available.

Website Page Analysis - To analyze the effectiveness of a financial institution's website pages.

Wallet Share Analysis - To identify the available wealth of Customers compared to their utilization of products and services of the financial services organization, with a view to measuring the actual and potential sell of the financial services organization. By knowing what the total number of potential customers are in the marketplace, what your percentage share of that number is based upon your own customer base and what households contain customers with your products – will enable you to target the remaining percentage share as potential customers of your products and services.

Website Visitor Analysis - To analyze the effectiveness and impact of a visit to the financial institution's website by an identifiable unique visitor where the visitor is human.

Payments

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).

Inwards Payments - To determine and analyze all inward payments within a given time period, usually daily.

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.

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.

Inwards Payments Volume - To determine and analyze a categorization of the inward payments report (i.e. volume of domestic).

Outward Payments - To determine and analyze all outbound payments within a given time period, usually daily.

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.

Payment Card Merchant Analysis - To assess the arrangements that the financial institution has with Merchants which entail the authorization and processing of payment transactions using Payment Cards in exchange for fee income for the financial institution.

Payment Origin And Destination - To provide analysis of where payments originate from, and their ultimate destination, from perspectives of the multiple Involved Parties (Originator, Beneficiary, Financial Institutions, etc.), and their Locations (Geographical Areas and electronic addresses). Location analysis may be used in a variety of ways, including:

- review domestic and cross-border payments
- explore regional trends, such as a review of the growth or decline in payment volumes in both mature established and developing markets
- review same-currency and cross-currency payments
- review trends in specific currencies
- monitor payments involving restricted currencies, locations and/or persons
- analysis of internal versus external payments

- evaluate the Channels used for Payments
- recognize trends, identify new channel opportunities.

Payment Limit Exception Analysis - To provide analysis of the various Limits applied during the processing of Payments, and a breakdown of where interventions are required due to breached limits. Limit violations can have a number of potential implications for the Financial Institution, including both Operational and Credit Risk impacts. There are many different types of Limits, against which Payment Transactions might need to be monitored. These might include Minimum Balances for Arrangements, Payment Transaction Limits/ Thresholds, or a Maximum Overnight Value for a given Arrangement / Involved Party. Monitoring of the volume of interventions required in the exceptions management process caused by limit violations provides an understanding of the cost implications for the FI. Also, by analyzing past events, key measures may be used to predict future limit breaches.

Payment Service Performance - To analyze Payment Service Levels with focus on the performance of the Payments processes, systems and services. This includes reviewing the payments at various stages through the full payments lifecycle. Through comparing the levels of exceptions and the processing times involved against defined thresholds for the Payment Type, the performance of each element in the payment process can be evaluated. By including the Organization Unit in the analysis, organizations without a centralized payments area can evaluate the effectiveness of the decentralized processes.

Payment Service Provider Analysis - To analyze traditional and newly emerging Payment Service Providers and Payment Types to understand trends in terms of changes in the habits of Customers, and to guide the evolution of relevant payment services and products, based on observed demands / trends.

Payment Service Reliability - To analyze Payment Service Levels with focus on Exception Management - measuring the resilience and reliability of the service. For example measurement of the levels of manual exceptions processing versus straight-through processing (STP), compared to predefined thresholds. Provide an examination of the reasons for the exceptions, and the impact on payment processing costs and revenue.

Payment Volume Cost And Revenue - To analyze the volume of Payments, the costs and revenue (non-interest income for the FI) generated from Payments services and a breakdown of where these are allocated amongst the various Involved Parties. To quantify the revenue generated from Payments services and products against the operating costs of providing these services to Customers. Allows comparison of the costs / revenue associated with the various channels, payment networks / systems / service providers used to make and receive payments, to support decisions about streamlining payments processing. By including the Organization Unit in the analysis, organizations without a centralized payments area may evaluate the cost effectiveness of decentralized processes.

¹ Notice: Clients are responsible for ensuring their own compliance with various laws and regulations, including the European Union General Data Protection Regulation. Clients are solely responsible for obtaining advice of competent legal counsel as to the identification and interpretation of any relevant laws and regulations that may affect the clients' business and any actions the clients may need to take to comply with such laws and regulations. The products, services, and other capabilities described herein are not suitable for all client situations and may have restricted availability. IBM does not provide legal, accounting or auditing advice or represent or warrant that its services or products will ensure that clients are in compliance with any law or regulation.



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