IBM Software
White paper

Information Management

IBM Banking and Financial Markets Data Warehouse Support for Basel Risk Data Aggregation

IBM

Introduction

Central to a successful risk data aggregation and reporting solution is the design of a reliable financial services data warehouse model. The model must be extensive to cover all the risk aspects of the financial institution while allowing for the adaptability of local supervisory and long-term regulatory changes. The model must define the data structures, which are imperative to how the data is loaded, aggregated and accessed. The model must be flexible enough to adapt to the changing requirements of the financial services industry.

IBM Banking and Financial Markets Data Warehouse (BFMDW) is the design for a consolidated enterprise risk solution, incorporating all aspects of the risk data from credit, market, liquidity and operational risk. BFMDW is optimized for financial services and has been incorporating support for Basel data for over 12 years.

BFMDW is a comprehensive and adaptable model, defining the data structures at both a granular and summarized level, providing the flexibility for aggregation of information in ad hoc queries or on-demand repetitive query analysis. BFMDW's design facilitates adaptability through design structures that can accommodate changes easily into the existing structures. It facilitates the distinction of actual, forecast and stress data to accommodate risk reporting scenarios as dictated by the Basel documentation and supervisory review. Extensive history support in the underlying models provides for the definition of current and past information, which is held for auditing and reporting purposes.

BFMDW facilitates project scoping and documentation through the provision of supporting models that describe external regulatory documentation and reporting requirements, with traceability of those requirements onto the underlying elements where the data is stored and aggregated.

BFMDW aligns with data governance policies through the provision of a business terms model, which consolidates the enterprises financial terminology into one reference model. That model is integrated with the data warehouse model and supporting models to provide full traceability of terminology from reporting solutions, through to the warehouse and to external taxonomies.

BFMDW is fundamental to the successful implementation of the financial institution's solution for Risk Data Aggregation.

Compliance Challenges

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

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

Financial institutions are faced with numerous compliance requirements. It is imperative that there is as much reuse as possible in the underlying IT infrastructure. This is especially the case in terms of data consolidation and reporting requirements.

As the worldwide financial regulatory approach switches from light touch supervision to tougher rule enforcement, there is a growing burden on financial institutions to provide more information to regulatory agencies, with clear demonstration of compliance. So in addition to the procedural and governance changes prescribed, there is an emphasis on quantitative measurement of compliance.

In order to understand the impact of these new rules, organizations are undertaking detailed analysis to extract the critical business data elements and key measures from detailed final rule documents.

In order to understand the multiple and inconsistent requirements from numerous regulatory agencies the critical data elements and measures identified must be translated from the taxonomy of the individual regulatory agencies into common business terms used by the financial institution. They must also be mapped to the financial institution's available information to determine from where the data is sourced to comply with the reporting requirements. This mapping also feeds into a gap analysis to determine the level of coverage for the new/revised requirements, and to inform IT development and data remediation strategies.

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

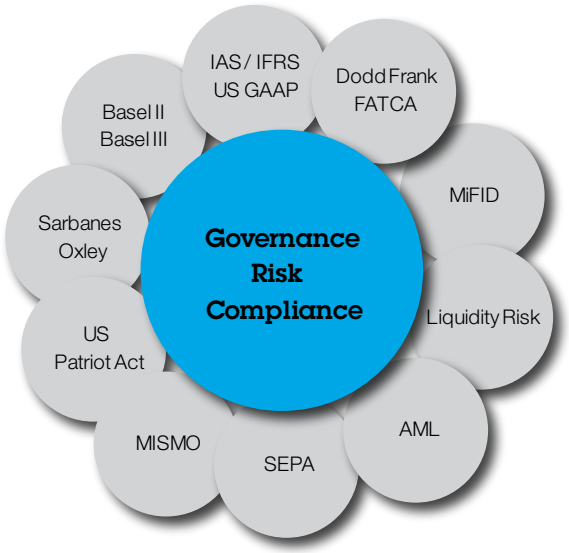

Figure 1. Compliance challenges facing financial institutions

Understanding Risk Data Aggregation

In January 2013, the Basel Committee on Banking Standards (BCBS) published a final version document entitled 'bcbs239 - Principles for effective risk data aggregation and risk reporting'. It describes risk data aggregation as "defining, gathering and processing risk data according to the bank's risk reporting requirements to enable the bank to measure its performance against its risk tolerance/appetite. This includes sorting, merging or breaking down sets of data."
The bcbs239 – Principles for effective risk data aggregation and risk reporting document can be found at http://www.bis.org/publ/bcbs239.htm

In the bcbs239 document, the Basel Committee has looked to address one of the key issues that arose out of the financial crisis, which was that banks' had inadequate IT and data architectures to support the broad management of financial risks. This resulted in weak risk data aggregation capabilities and risk reporting practices.

To address this issue, the Basel Committee requires participating banks to comply with 14 Principles on the 'risk data capabilities and risk reporting practices' of a bank. In essence, the Basel Committee has focused on a bank's internal reporting mechanism and the data quality and reporting procedures that underline that mechanism. Its objectives are to enhance a bank's risk reporting infrastructure so that high quality, accurate reports are produced to facilitate improved decision making by the banks board, senior management, and external bodies such as the national supervisor. To manage risk effectively, the right information needs to be presented to the right people at the right time. Importantly, the Basel Committee expects the reporting mechanism to function, as defined in the Principles, both in normal times and in times of stress/crisis.

In the bcbs239 document, the Basel Committee has stated six objectives regarding a banks adoption of the 14 Principles:

- Enhance the infrastructure for reporting key information, particularly that used by the board and senior management to identify, monitor and manage risks
- Improve the decision-making process throughout the banking organization
- Enhance the management of information across legal entities, while facilitating a comprehensive assessment of risk exposures at the global consolidated level
- Reduce the probability and severity of losses resulting from risk management weaknesses
- Improve the speed at which information is available and hence decisions can be made
- Improve the organization's quality of strategic planning and the ability to manage the risk of new products and services

The 14 Principles

In the bcbs239 document, the Basel Committee sets out its requirements as a set of 14 Principles, which are divided into four categories:

Overarching governance and infrastructure

- Principle 1 – Governance
- Principle 2 – Data architecture and IT infrastructure

Risk data aggregation capabilities

- Principle 3 – Accuracy and Integrity
- Principle 4 – Completeness
- Principle 5 – Timeliness
- Principle 6 - Adaptability

Risk reporting practices

- Principle 7 – Accuracy
- Principle 8 – Comprehensiveness
- Principle 9 – Clarity and usefulness
- Principle 10 – Frequency
- Principle 11 – Distribution

Supervisory review, tools and cooperation

- Principle 12 – Review
- Principle 13 – Remedial actions and supervisory measures
- Principle 14 – Home/host cooperation

Timeline for implementation

The initial focus is on global systemically important banks (G-SIBs) as identified by the Financial Stability Board in November 2011 and 2012. These G-SIBs are expected to comply with the principles by January 2016.

National supervisors are also encouraged to apply the Principles to their own domestic systemically important banks (D-SIBs). National supervisors and the Basel Committee monitor and assess the progress of banks in meeting these Principles.

Driving Forces

BCBS239 is a regulatory requirement specified by the Basel Committee and enforced by national supervisors. In other to achieve compliance, a bank must implement the 14 Principles as specified by the National Supervisors by January 2016. Failure to meet the deadlines will result in supervisory discipline of the financial institution. The impending deadlines are driving financial institutions to seek industry solutions to expedite the implementation process, while also allowing for flexibility to accommodation local and financial institutions specific risk components.

A bank itself can gain a significant degree of benefit from having a full and complete understanding of its own risk position through risk data aggregation and accurate and reliable reporting.

IBM Banking and Financial Markets Data Warehouse Components

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

Frequently the problem for organizations is not the amount of data available, but rather the consistency, accuracy, timeliness, complexity and relevancy of it. BFMDW offers an integrated set of models that consistently describe and integrate enterprise data while providing traceability throughout the layers of the information architecture.

Business Terms

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

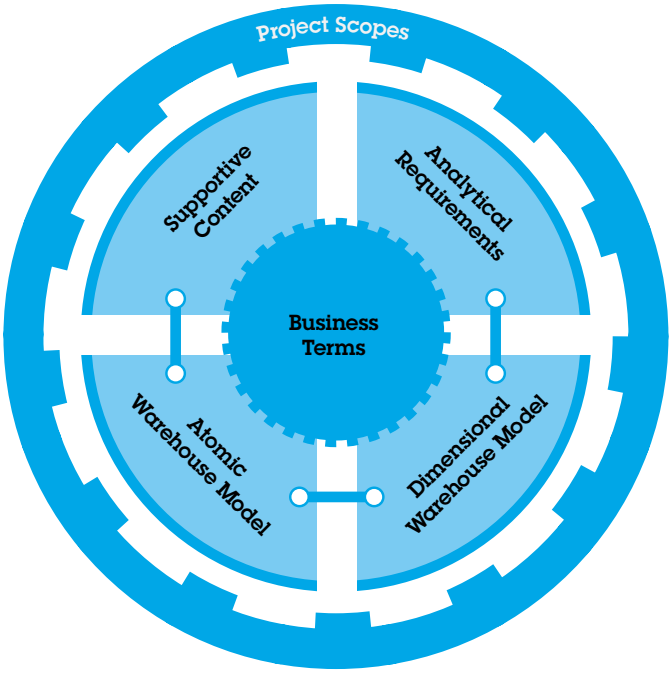

Figure 2. IBM Banking and Financial Markets Data Warehouse components

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

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

Analytical Requirements

Analytical Requirements reflect 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. They enable rapid scoping and prototyping of data marts, which provide a subject-specific analytical layer in a data warehouse solution.

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

Atomic Warehouse Model

The Atomic Warehouse Model is the design for the structures to store the consolidated enterprise information. It is derived from the Business Terms and so provides traceability from business terminology onto the technical assets. It is optimized as a data repository that can hold long-term history across all lines of business.

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

Dimensional Warehouse Model

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

This repository holds sufficient and complete data to meet the needs of business user analysis. Dimensional models are more easily understood by business users and are optimized for data querying through the provision of pre-aggregated fact structures at the center of the star schema design.

Supportive Content

Supportive Content provides a method of mapping both external and internal terms from business standards, taxonomies, regulatory documents, dictionaries, applications and other such requirements to the Business Terms and to the Atomic and Dimensional Warehouse Models. This helps business users and other subject matter experts understand how and where their business terms are supported in the underlying models.

Project Scopes

Across all models, specific content items can be associated with different project phases in project scopes. These project scopes are also used to highlight content support for specific topics, including aspects of the models to support the risk components and disclosures for Basel.

The role of the IBM Banking and Financial Markets Data Warehouse in the 14 Principles of Risk Data Aggregation

Overarching governance and infrastructure

A bank should put in place the foundational components that are required to meet the Principles – namely a strong governance framework, risk data architecture and IT infrastructure. These are preconditions in order to meet the Principles.

Principle 1 – Governance

Principle Summary: The Basel Committee places emphasis on the role of a bank's board and senior management regarding governance. It encourages the board and senior management to oversee that the bank's risk data aggregation capabilities and risk reporting practices are subjected to strong governance and have adequate resources. This includes having a complete understanding of any impediments to full risk data aggregation and data quality risks. A bank's board is also responsible for determining its own risk reporting requirements and should be aware of any restrictions that prevent full data aggregation in the reports.

BFMDW is a well-established and used industry design model with a large customer base from G-SIBS to credit institutions. The model has extensive support for the data requirements of Basel from risk component calculation to risk reporting and so provides a stable mechanism for risk data aggregation. This is an invaluable component of the implemented risk data aggregation. The Analytical Requirements provide the definition of the downstream reporting requirements, which are fully traceable back to the data-warehouse model. By integrating source systems and other applications with the BFMDW, full traceability of data is possible, allowing an earlier identification of restrictions in data aggregation.

The Business Terms provide a common enterprise reference dictionary that supports the consolidation of terminology across the enterprise in a data governance framework. The terms are fully described including references and relationships to the rest of the models.

Principle 2 – Data architecture and IT infrastructure

Principle Summary: This principle specifies that a bank should have a data architecture and IT infrastructure to fully support its risk data aggregation capabilities and risk reporting practices; in normal times and in times of stress. Risk data aggregation should be included as part of business continuity planning. There needs to be clear ownership and control of data and related technologies at all levels – business and IT – to ensure correct quality of data. A group-wide data taxonomy and architecture should also be established.

Enabling financial institutions to build data warehouse solutions to suit their specific needs, BFMDW has the flexibility to create a range of data warehouse solutions from departmental data marts to enterprise-wide data warehouses, while including the key components required for the core of a data warehousing solution. BFMDW is the cornerstone component of an organization's customized development of a data warehouse and BI environment.

BFMDW also comprises a proven, flexible and scalable data-warehouse-technical infrastructure, enabling organizations to build comprehensive data warehouse solutions with a view to delivering business value rapidly without compromising on a scalable, technical data warehouse infrastructure. Financial institutions use BFMDW to address their regulatory requirements or to evolve their current risk management and reporting capability to a higher level of maturity by building on a proven foundation that addresses these specific requirements.

The implementation of a data warehouse based on BFMDW provides the basis on which a risk data solution can be built. One of the principal functions of a data warehouse is the storage of historical data. This is a key differentiator between an operational data store and a data warehouse. This is important for risk data as the user can not only get the current picture of the risk position but also how that risk position changes over time.

Risk data aggregation capabilities

Banks should implement strong risk data aggregation capabilities to ensure the delivery of reliable risk management reports.

Principle 3 – Accuracy and Integrity

Principle Summary: Banks should have the capability to produce accurate and reliable risk data reports at normal times and at times of stress. Data should be aggregated automatically where possible to minimize errors. As a precondition the bank should have a dictionary of concepts so that data is consistently defined across the organization. The reporting mechanism should be automated where possible. The bank should measure and monitor accuracy of data and have the correct procedures in place to address data quality issues.

BFMDW provides the design for the storage of aggregated data with predefined structures specifically for Basel risk reporting and analysis. These Summary, Profile and Fact structures allow for a permanent history of the calculated values to be maintained for auditability purposes. It also provides for a consistent source of analytical data, removing the inconsistencies that can occur in the ad hoc calculations of down-stream applications.

This Principle also stipulates that, as a precondition to the other Principles, a bank should have a dictionary of data concepts that are used across the organization. BFMDW includes a business vocabulary, which provides an integrated reference point for business terms and descriptions of information that is used across the enterprise. It provides a true consolidated reference model that is not targeted or specialized for only one aspect of the financial institution's business. It is independent of any physically implemented solution.

Principle 4 – Completeness

Principle Summary: All material risk exposures should be included under risk data aggregation capabilities. They should be captured and aggregated across the banking group. Relevant risk data should be available such as legal entity, asset type and region. The specific approach being used to aggregate exposures for a given risk measure should be clear. Banks should be able to produce complete aggregated risk data and be able to measure and monitor that completeness.

BFMDW provides components that are heavily focused on facilitating the users (both business and IT) in defining the exact data details that need to be reported and presented for analysis.

A core requirement of the Principles is that a bank has the ability to aggregate its risk data. BFMDW provides the atomic level data, summary and aggregated fact entities to aid the aggregation of risk data. The models provide the flexibility to aggregate risk data across a number of axes including the legal entity, asset type and region. This is an inherent part of the design of the atomic model and aggregate fact structures.

The Analytical Requirements facilitate the rapid definition of the downstream reporting solutions. The inter-model dependencies allow for the fast prototyping of the data-warehouse solution. This allows for data source analysis activities to begin sooner, facilitating parallel activities and faster project deliverables. This feature of the models allows for rapid adaptability of the requirements until the complete solution is identified, from the business requirements through to consolidated data definition and the sourcing the financial institution data.

Principle 5 – Timeliness

Principle Summary: Aggregated risk information should be produced on a timely basis to meet reporting requirements. Risk systems need to be capable of producing aggregated risk data rapidly during times of stress for all critical risks.

Critical risks include:

- aggregated credit exposure to a large corporate borrower
- counterparty credit risk exposures
- trading exposures
- liquidity risk indicators
- operational risk indicators

Supervisors review that the bank can generate aggregate and up-to-date risk data in a timely manner.

BFMDW provides the structures to store summary or aggregated data at time periods specified by the business. These structures also include support for the analysis of real versus stress scenario data.

BFMDW defines risk exposures at the level of the credit exposure, borrower, product, portfolio or institution. Risk indicators are defined on the summary or profile level for the appropriate business entity. BFMDW clearly distinguishes the aspects of Credit, Market, Liquidity and Operational Risk for both independent and integrated risk data analysis.

Principle 6 – Adaptability

Principle Summary: A bank should be able to produce aggregate risk data to meet a wide range of on-demand, ad hoc risk management reporting requests in both normal and stressful times.

Adaptability includes:

- flexible data aggregation processes
- ability to customize data to the user's needs and drill-down as required
- ability to incorporate new developments
- ability to incorporate new regulations

Banks should be able to generate subsets of data based on requested scenarios.

BFMDW provides structures that capture data at its most atomic level from transaction systems, which provide key data that can be aggregated in multiple ways for ad hoc reporting and drill-down analysis. In addition, the models also provide the structures to store pre-aggregated information for on-demand data analysis.
The wealth and depth of existing content in BFMDW covers a wide array of regulation including Basel, FATCA, and Dodd-Frank. BFMDW caters for all these regulatory issues in a consistent and integrated manner so the concepts identified and used for one regulatory issue can be reused or analyzed for impact on another. The models are continually upgraded where new releases address ongoing developments in Basel and other regulatory directives.

Although there is a significant level of content already in the models all the IBM Banking and Financial Markets Data Warehouse can be customized by the financial institution to incorporate local and specific requirements. Comprehensive guidance and documentation on how to customize BFMDW is included as part of the delivered product.

Risk reporting practices

In summary, this section covers accuracy, completeness and timeliness of risk data. This is a foundation for effective risk management. It is about getting the right information, to the right people, at the right time.

Principle 7 - Accuracy

Principle Summary: Risk management reports should be accurate and reflect risk in an exact manner. The banks board and senior management need to have full confidence in the accuracy and precision of any risk management reports on which decisions are based.

To ensure accuracy in reports, a bank should maintain:

- defined requirements and processes to reconcile reports to risk data
- edit and reasonableness checks including details of validation rules applied to quantitative information and explanations mathematical or logical conventions used
- procedures for identifying, reporting and explaining data issues in data integrity

Banks should establish expectations for the reliability of approximations to ensure that recipients can confidently rely on the information. Senior management should establish accuracy and precision requirements for regular and stress/crisis reporting. Also, banks are expected to consider accuracy requirements regarding accounting materiality.

For data to be trusted by the decision makers it needs to have a high degree integrity or quality. The higher the data quality the more accurate the decisions can be made. Data quality is typically under the jurisdiction of data governance.

It is feasible at the requirements definition stage to consider materiality by ensuring that the right requirements are being defined and nothing of material importance are being left out. The spread and granularity of the detail in BFMDW promotes accuracy. For example, where applicable, measures are further broken down into submeasures allowing for the user to define the level of granularity required. The reporting requirements are not just a definition of measures but also the other measures used in their calculation. The user can specify the business calculation rules for quantitative information.

Principle 8 – Comprehensiveness

Principle Summary: Banks are expected to determine the risk reporting requirements consistent with the size and complexity of the bank's operations and risk profile.

Risk management reports should cover all significant risk areas (credit, market, liquidity, operational) and their significant components.

Reports should identify emerging risk concentrations. Banks are expected to determine risk reporting requirements that best suit their own business models and risk profiles. Risk management reports for the board and senior management are expected to provide a forward-looking assessment of risk and not rely on current and past data.

BFMDW has a long history of support for Basel with an extensive set of structures for modeling all aspects of the enterprise credit, market, liquidity and operational risk data. The Atomic Warehouse model gives both detailed risk data and also provides the ability to have an aggregated view of that data. For example, consider an exposure to a customer modeled as a BDW Arrangement, a snapshot of the balance can be taken at a point in time or it can be summarized over a particular period. This Arrangement can also be viewed from a number of different perspectives, for example by counterparty to sum the total balance, or by product to determine the overall exposure by product type.

The Analytical Requirements and corresponding Dimensional Star Schemas identify the key elements required for the analysis of actual, forecast or stress based risk concentrations and correlation, by region, asset type, legal entity, and so on. All of the models are fully customizable to the financial institutions specific requirements.

The depth of content in the model provides an advantage to the user in ensuring that the full, complete coverage of their risk requirements are defined. BFMDW provides the ability to drive out scoped solutions from the Analytical Requirements across the business terms and underlying data warehouse models. This allows the financial institution to take the enterprise-wide comprehensive model and quickly zone in on the aspects they need to incorporate in each project.

Principle 9 – Clarity and usefulness

Principle Summary: Risk reports must be clear, meaningful and tailored to the needs of the consumer – the board and senior management. Risk reports should contribute to sound risk management and decision making and should include a balance between risk data, analysis and interpretation, and qualitative explanations. Reporting policies and procedures should recognize the differing information needs.

The bank's board is responsible for determining its own risk reporting requirements and should alert senior management if reports do not meet their requirements or contain the correct information. Senior management also has a responsibility for determining its own risk reporting requirements. A bank should develop an inventory and classification of risk data items. Banks are expected to periodically confirm with recipients that reports are relevant and appropriate for their needs.

This Principle requires that a bank's risk reports should be relevant to recipients so that the reports can contribute to better decision making. It is vitally important that the reporting requirements are captured correctly. BFMDW provides detailed content and functionality to aid in requirements gathering. The Analytical Requirements and Supportive Content provide a flexible mechanism so that pre-defined regulatory reports and ad hoc reports can be easily scoped as required.

BFMDW includes a standard vocabulary of business terms that is consistent throughout the models. This provides a structured inventory of risk data items and allows the bank to standardize the terms it uses to describe risk ultimately leading to greater confidence and clarity in the reported data.

Principle 10 – Frequency

Principle Summary: The frequency of risk reporting should reflect the needs of the recipients. Risk report frequency varies according to the type of risk, purpose and recipients. It is expected that, in times of crisis, all relevant and critical credit, market and liquidity reports are available within a short period.

In a data warehouse, information is typically available daily. BFMDW provides data time stamps that can dictate the frequency of when data should be stored in the summarized structures. The frequency as to how often a report is produced should be considered at the requirements definition stage.

Principle 11 – Distribution

Principle Summary: Rapid collection and analysis of risk data and timely dissemination to relevant parties is expected. Banks need to confirm periodically with recipients that reports are being received in a timely fashion.

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 departmental, line of business oriented or business function oriented.

BFMDW, especially the deployment of the dimensional model in a data mart, makes the data available for analysis by many different business users. At data analysis stage, the requirements have been defined. The data has been sourced and aggregated and it is now made available to users to analyze. The data is brought into a data mart and ready for reports. Various individual lines of business or departments may want to focus on a subset of that the data so it makes sense to have the data in a well-designed data mart and that the data mart design comes from the dimensional model.

Various individual lines of business or departments may want to focus on a subset of that the data which should be derived from a common, integrated design model. The dimensional warehouse model facilitates the identification of topic or project specific content through the individual facts based on the shared dimensions.

Supervisory review, tools and cooperation

Supervisors monitor and provide incentives for a bank's implementation and compliance with the Principles. Supervisors also review the implementation of the Principles to ensure that they are having the wanted effect.

Principle 12 – Review

Principle Summary: Supervisors may test a bank's compliance with the Principles through occasional requests for information. They should have access to the appropriate reports to be able to perform this review. Supervisors should test a bank's capabilities to aggregate data and produce reports in both stress/crisis and steady-state environments, including sudden sharp increases in business volumes.

Supervisors should draw on reviews conducted by the internal or external auditors to inform their assessments of compliance with the Principles.

For review of the data aggregation, the Analytical Requirements model defines the reporting details including external and supervisory reported information. This model allows the financial institution to document the detail of the risk information required for supervisory review and to overlay that requirement onto other financial reports to facilitate reuse of implemented data reporting solutions. The model also facilitates the documentation of the supervisory review through the project scoping mechanism, which identifies the full scope of the requirement across the business terms, data warehouse and reporting terms. The underlying warehouse provides the design structures to store the information used in the reports, which provide full history of risk data to satisfy internal and external auditor data requirements.

Principle 13 – Remedial actions and supervisory measures

Principle Summary: Supervisors may set limits on a bank's risk or activities should they deem the risk data aggregation and reporting capabilities as being weak.

If remedial action is required, the supervisor sets a timetable for completion and have a procedure for escalating should the bank not address the issues adequately.

Where the supervisory review recommends changes in the financial institutions risk disclosures, BFMDW facilitates the faster documentation of reporting requirements through the Analytical Requirements, which can quickly identify the changes required on the underlying data warehouse model. This allows the financial institution to quickly identify the gaps in their data and begin immediate tasks of data sourcing. The traceability of business requirements through to the data warehouse provides for a path of aggregation and sourcing of data, which allows the financial institution quickly identify target entities to change.

Principle 14 – Home/host cooperation

Principle Summary: Home and host supervisory authorities should cooperate effectively and avoid redundancy when considering a bank's risk management practices across a number of jurisdictions. Supervisors should look to share information where allowed and discuss their experiences.

Solutions developed with BFMDW can provide a consistency of approach, which facilitates the aggregation of data within a financial institution and also across jurisdictions.

Financial Institution reporting structure and organization relationships can be modeled in BFMDW and the appropriate risk aggregation information associated at the right level. This provides transparency when analyzing a financial institutions risk data across different jurisdictions. Solutions developed using the Analytical Requirements provide a consistent approach for measure and dimension detail, which can facilitate the comparison of reported information by financial institution.

Existing support for Basel in the Banking & Financial Markets Data Warehouse Model

Basel Support has been evolving in BFMDW over a number of releases, since the Banking and Financial Markets Data Warehouse 3.1 in 2002:

- Banking and Financial Markets Data Warehouse 3.1 included enhancements to the existing risk components to extend the support for Basel II Credit Risk.
- Banking and Financial Markets Data Warehouse 3.2 further extended the existing structures to support Credit Risk IRB Advanced based on Consultative Paper 3 (CP3).
- Banking and Financial Markets Data Warehouse 3.3 provided explicit support for Operational Risk assessment and loss information, and the final changes that are presented in the Basel II Framework, June 2004.
- Banking and Financial Markets Data Warehouse 3.4 included support for the Basel II paper (July 2005) on Counterparty Credit Risk, Double Default, and Maturity Adjustments for trading related activities impacting the banking book.
- Banking and Financial Markets Data Warehouse 7.0 supported the Comprehensive Version of the Revised Framework (2006), which is a compilation of the June 2004 Basel II Framework, the elements of the 1988 Accord that were not revised during the Basel II process, the 1996 Amendment to the Capital Accord to Incorporate Market Risks, and the November 2005 paper on Basel II: International Convergence of Capital Measurement and Capital Standards: A Revised Framework.
- Banking and Financial Markets Data Warehouse 8.0 provided more support for Basel II Notice of Proposed Rulemaking (NPR) allowing financial institutions in the US to start implementing the Basel II advanced approaches before they became an official requirement
- Banking and Financial Markets Data Warehouse 8.3 included full support for the Advanced Capital Adequacy Framework and Standardized Framework for the US

- Banking and Financial Markets Data Warehouse 8.3 incorporated support for July 2009 paper, Enhancements to the Basel II Framework published by Basel Committee on Banking Supervision, as well as the finalized ruling as published in the US Federal Register on the Advanced Capital Adequacy Framework and Risk-Based Capital Guidelines for Capital Adequacy using the Standardized Framework
- Banking and Financial Markets Data Warehouse 8.4 supported the Guidelines for computing capital for incremental risk in the trading book (BCBS 159, July 2009) and also addressed the market risk considerations that are published in "Revisions to the Basel II market risk framework" in July 2009. This release also addressed the then recently published documents on liquidity and global capital framework and counterparty credit risk considerations that are published in "Basel III: International framework for liquidity risk measurement, standards, and monitoring" and "Basel III: A global regulatory framework for more resilient banks and banking systems"
- Banking and Financial Markets Data Warehouse 8.5 addressed the European based CRD and COREP interpretations of Basel, as well as newly published considerations for Global Systemic Important Banks (BCBS207) and back testing for counterparty credit risk (BCBS185)
- Banking and Financial Markets Data Warehouse 8.6 addressed the Liquidity Coverage Ratio breakdown, as specified in the workbook that is periodically updated by the BCBS, and, which specifies how various Basel III quantitative disclosures should be made (Basel III monitoring workbook)

Predefined Project Scopes

Basel II Project

The Basel II project scopes highlight elements of each of the IBM models that support different components of Basel across all 3 pillars – Minimum Capital Requirements, Supervisory Review and Market Discipline.

Pillar 1 (Minimum Capital Requirements)

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

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

Pillar 2 (Supervisory Review Process)

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

- Collateral Management
- 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 highlight elements of each of the IBM models that support 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

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