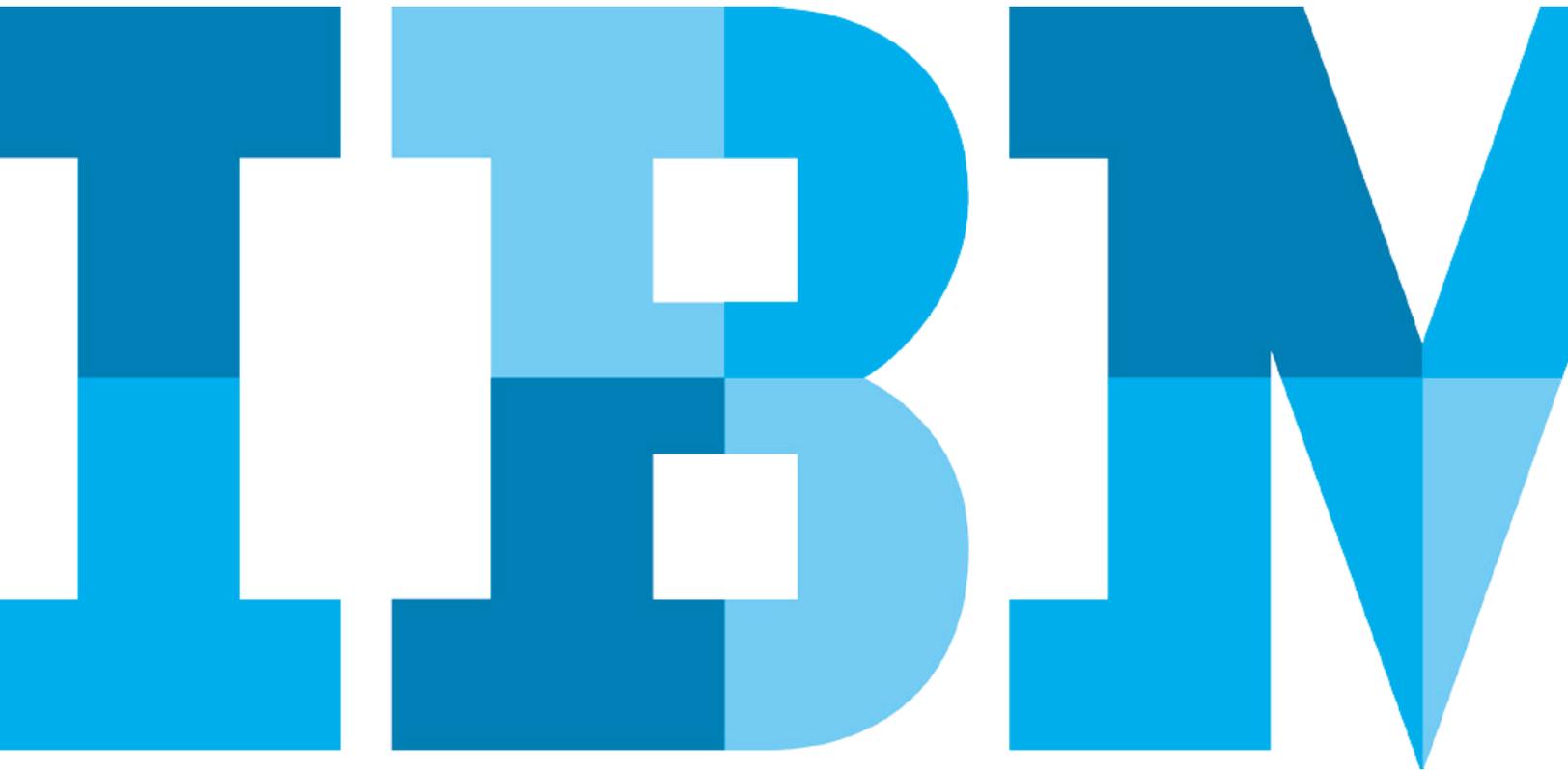


Using IBM Banking and Financial Markets Data Warehouse to Support Basel II / III



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 Dodd-Frank, IFRS/IAS, MISMO, Sarbanes-Oxley Act, and Basel II/ III.

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

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

As the requirements may come from multiple agencies, and may contain inconsistent terminology, it is helpful to translate the critical data elements from the terms used by the individual regulatory agencies into a set of 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, if required.



Figure 1. Compliance challenges facing financial institutions

Basel II / III

The Bank for International Settlements (BIS) introduced the new capital accord in 2001. Also known as the Basel II Capital Accord, the New Basel Capital Accord is applied on a consolidated basis to internationally active banks to address the risk management practices for active financial institutions in the international arena.

The Basel II Accord was the result of substantial losses in the international markets since 1992, which were attributed to poor risk management practices. The Basel II Accord makes it mandatory for financial institutions to use standardized measurements of credit, market risk, and operational risk. However, different levels of compliance allow financial institutions to pursue advanced risk management approaches to free up capital for investment.

Basel III is an extension of the existing Basel II Framework, and introduced new capital and liquidity standards to strengthen the regulation, supervision, and risk management of the banking sector. The global capital framework and capital buffers require financial institutions to hold more capital and higher quality of capital than under Basel II rules. The leverage ratio introduced a non-risk-based measure to supplement the risk-based minimum capital requirements. The liquidity ratios ensure that adequate funding is maintained in case of severe crisis.

Basel III Summary

Capital Framework

Higher Minimum Tier 1 Capital Requirements

Tier 1 Capital Ratio increases from 4% to 6%. The ratio is set at: 4.5% from 1 January 2013, 5.5% from 1 January 2014, 6% from 1 January 2015.

Capital Conservation Buffer

Designed to absorb losses during periods of financial and economic stress. Financial institutions are required to hold a capital conservation buffer of 2.5% to withstand future periods of stress, bringing the total common equity requirement to 7% (4.5% common equity requirement and the 2.5% capital conservation buffer). The capital conservation buffer must be met exclusively with common equity. Financial institutions that do not maintain the capital conservation buffer face restrictions on payouts of dividends, share buybacks, and bonuses.

Counter-cyclical Capital Buffer

A counter-cyclical buffer within a range of 0% and 2.5% of common equity or other fully loss absorbing capital will be implemented according to national circumstances. This buffer serves as an extension to the capital conservation buffer.

Higher CET1 – Common Equity Tier 1

Increase from 2% to 4.5%. The ratio is set at: 3.5% from 1 January 2013, 4% from 1 January 2014, 4.5% from 1 January 2015

Minimum Total Capital Ratio

Remains at 8%. The addition of the capital conservation buffer increases the total amount of capital a financial institution must hold to 10.5% of risk-weighted assets, of which 8.5% must be tier 1 capital. Tier 2 capital instruments will be harmonized and tier 3 capital will be abolished.

Liquidity Framework

Liquidity Coverage Ratio (LCR)

To ensure that sufficient levels of high-quality liquid assets are available for one-month survival in a severe stress scenario.

Net Stable Funding Ratio (NSFR)

To promote resilience over long-term time horizons by creating more incentives for financial institutions to fund their activities with more stable sources of funding on an ongoing structural basis.

Changes to Counterparty Credit Risk (CCR)

CVA Risk Capital Charge

Basel III introduces capital requirements to cover Credit Value Adjustment (CVA) risk and higher capital requirements for securitization products.

Support for Basel III

With its flexibility to enable the creation of a range of data warehouse solutions from departmental data marts to an enterprise-wide data warehouse, IBM Banking and Financial Markets Data Warehouse helps financial institutions build data warehouse solutions to suit their specific needs. It comprises a proven, flexible, and scalable data warehouse technical infrastructure to address the following business reporting and analysis needs:

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

The pace of change that is driven by the compliance challenges is different across financial institutions. However, there is now a general recognition that the long-term direction of aligning economic and regulatory capital means that risk-weighted assets and economic capital calculations should eventually become a key driving force for decisions within the financial institution.

The long-term business of a financial institution is dependent on maximizing return on capital (ROC) and risk-adjusted return on capital (RAROC). Risk-weighted asset and capital calculations may be used to provide bespoke pricing. This allows the financial institution to determine which products should be promoted to which customers to achieve maximum return on investment (ROI) and so becomes the driver for marketing and relationship management.

Data structures that drive risk and financial data need to be aligned to risk-based data, such as:

- Transactional data that covers all types of transaction, and links the financial results of each transaction with the risk and financial objectives of the financial institution.
- Asset data that covers all types of assets that are linked to the transaction. The valuation of these assets and the correlation of asset behavior.
- Customer data for all counter parties including credit risk measurement of the counter party, making provisions when new information or circumstances change that risk. Detailed data on customer is required to support product selection and pricing in addition to other relationship management decisions.

There are different ways to view this data and not all are represented by either risk or financial systems. Executive management and regulators need coherent views. This approach requires an integrated data environment supporting the decision-making and reporting requirements across the entire financial institution.

Given the connection between risk, finance and customer insight, financial institutions require an integrated data environment supporting the decision-making and reporting requirements across all aspects of the business and compliance requirements.

IBM Banking and Financial Markets Data Warehouse provides the framework for such an enterprise data integration environment. It has comprehensive support for the Basel II/III Framework, IFRS/IAS, and General Ledger information in addition to all other areas of banking. It supports the data requirements of Basel II/III, providing comprehensive data coverage for retail and wholesale banking. It can also be integrated with other Basel II/III risk applications or engines to provide an end-to-end risk management framework for the financial institution.

Support for non-Basel III financial institutions

The risk structures that are defined in IBM Banking and Financial Markets Data Warehouse are not just of interest to financial institutions, which are either internationally active financial institutions or identified by the regulators that are required to implement Basel II/III, but are applicable to any organization that wants to improve the capability of their risk management systems.

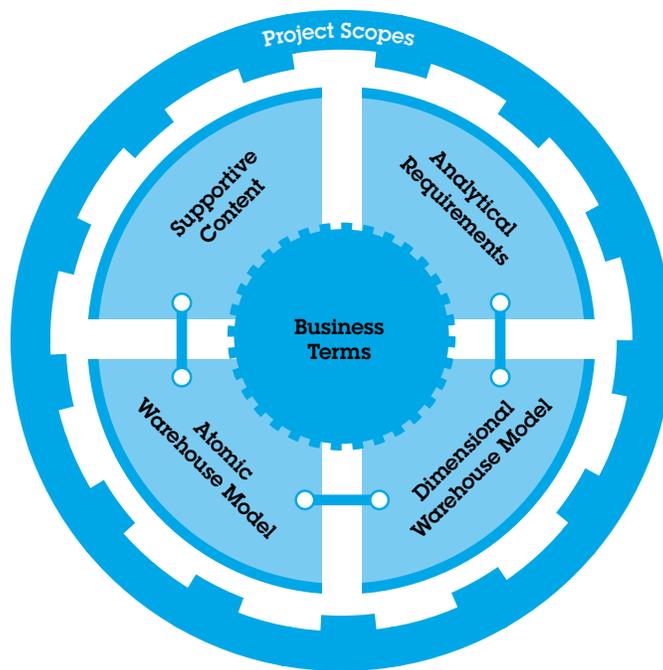


Figure 2. IBM Banking and Financial Markets Data Warehouse components

IBM Banking and Financial Markets Data Warehouse Components

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

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

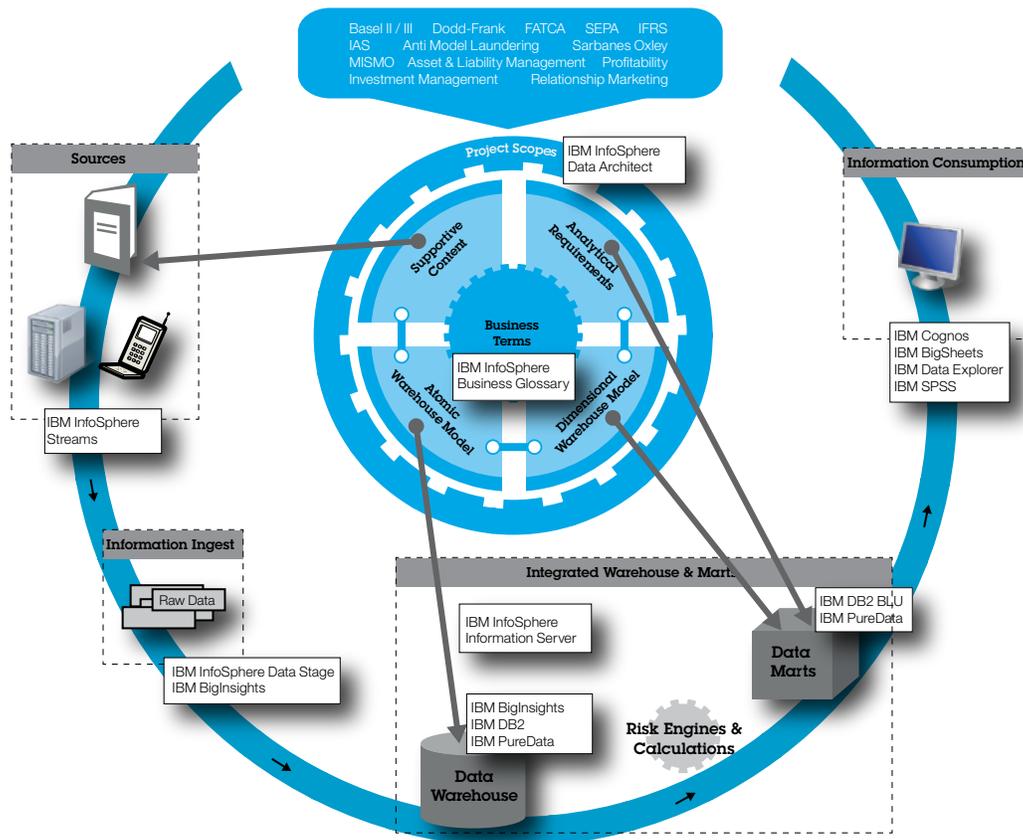


Figure 3. Typical implementation architecture

It has comprehensive atomic-level structures in place to address credit, market, operational, and liquidity risk approaches specified in the Basel II/III Framework for Pillar 1 Minimum Capital Requirements. As well as providing the necessary atomic data structures, it has significant support for the aggregations that are required by Basel II/III. The model components work together as a set of complementary content models that are aimed at solving distinct management information business requirement and data architectural issues. The individual elements within each model component can be mapped to elements in other components to show the traceability from one information consideration to another.

Figure 3 shows a typical Basel II/III architecture supported by IBM Banking and Financial Markets Data Warehouse. This architecture outlines the six tiers of functionality that is needed to support Basel II/III:

Data Sources - The internal and external sources of all data that is required for Basel II/III

Extraction - The processes and technology that is needed to extract the data from the potentially diverse sources in an efficient and timely manner

Enterprise Data Store - The repository into which all the detailed data needed for Basel II/III is gathered

Transformation and Calculation - The carrying out of various calculations by specialist risk applications

Data Marts - Aggregated data for reporting and analysis

Reporting - The creation and delivery of the Basel II/III reports to the various user groups

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.

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

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

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

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

Dimensional Warehouse Model

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

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

Supportive Content

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

Project Scopes

Project Scopes are the method by which business issues are captured within a data warehouse implementation project. A project scope defines the business issue in terms of a set of items, possibly from several different constituent models, within a data warehouse instance.

IBM Banking and Financial Markets Data Warehouse Support for Basel II / III

Analytical Requirements

Analytical Requirements provide the underlying reporting structures for Basel II Pillar 3 Market Discipline Quantitative Disclosures as defined in the Basel II/III Framework documentation that is published by BCBS.

Legend

Pillar 1		Pillar 2		Pillar 3	
C1	Credit Risk	B2	Board and Management Oversight	C3	Capital
M1	Market Risk	C2	Sound Capital Assessment	R3	Risk Exposure and Assessment
O1	Operational Risk	R2	Risk Assessment		
		M2	Monitoring and Reporting		

Risk management Category	Solution Name	Pillar 1			Pillar 2				Pillar 3			
		C1	M1	O1	B2	C2	R2	M2	I2	C3	R3	
Credit Risk	Risk	Security Analysis	✓	-	-	✓	-	✓	✓	✓	-	✓
	Risk	Collections Analysis	✓	-	-	✓	-	✓	✓	✓	-	✓
	Risk	Non Performing Loan Analysis	✓	-	-	✓	-	✓	✓	✓	-	✓
	Risk	Outstandings Analysis	✓	-	-	✓	-	✓	✓	✓	-	✓
	Risk	Location Exposure	✓	-	-	✓	-	✓	✓	✓	-	✓
	Risk	Credit Risk Analysis	✓	-	-	✓	-	✓	✓	✓	-	✓
	Risk	Credit Risk Assessment	✓	-	-	✓	-	✓	✓	✓	-	✓
	Risk	Credit Risk Mitigation Assessment	✓	-	-	✓	-	✓	✓	✓	-	✓
	Risk	Credit Risk Exposure Analysis	-	-	-	-	-	-	-	-	-	-
	Risk	Involved Party Exposure	✓	-	✓	✓	-	✓	✓	✓	-	✓
	A&L	Credit Loss Allowance Analysis	✓	-	-	✓	-	✓	✓	✓	-	✓
	A&L	Structured Finance Analysis	✓	-	-	✓	-	✓	✓	✓	-	✓
	Risk	Portfolio Credit Exposure	✓	-	-	✓	-	✓	✓	✓	-	✓
	Risk	Insurance Risk Profile	✓	-	✓	✓	-	✓	✓	✓	-	✓
	Risk	Customer Credit Risk Profile	✓	-	-	✓	-	✓	✓	✓	-	✓
	Risk	Securitization Detail Analysis	-	-	-	-	-	-	-	-	-	-
	Risk	Advanced IRB And AMA Analysis	-	-	-	-	-	-	-	-	-	-
	Risk	Advanced Risk Based Capital Analysis	-	-	-	-	-	-	-	-	-	-
	Risk	Securitization Analysis	✓	-	-	✓	-	✓	✓	✓	-	✓
	Risk	Economic Capital Analysis	-	-	-	-	-	-	-	-	-	-
Interest Rate Risk	Risk	Interest Rate Risk Analysis	-	✓	-	✓	-	✓	✓	✓	-	✓
	A&L	Interest Rate Sensitivity Analysis	-	✓	-	✓	-	✓	✓	✓	-	✓
	A&L	Net Interest Margin Variance	-	✓	-	✓	-	✓	✓	✓	-	✓
Operational Risk	Risk	Operational Risk Assessment	-	-	✓	✓	-	✓	✓	✓	-	✓
	Risk	Operational Risk Loss Analysis	-	-	✓	✓	-	✓	✓	✓	-	✓
	Rel	Customer Complaints Analysis	-	-	✓	✓	-	✓	✓	✓	-	✓
	Comp	Foreign Financial Account Analysis	-	-	✓	✓	-	✓	✓	✓	-	✓
	Rel	Market Analysis	-	-	✓	✓	-	✓	✓	✓	-	✓
	Comp	Suspicious Activity Analysis	-	-	✓	✓	-	✓	✓	✓	-	✓
	Comp	Transaction Activity Analysis	-	-	✓	✓	-	✓	✓	✓	-	✓
	A&L	Income Analysis	-	-	✓	✓	-	✓	✓	✓	-	✓
	Prft	Product Analysis	-	-	✓	✓	-	✓	✓	✓	-	✓
	Risk	Authority Profiling	-	-	✓	✓	-	✓	✓	✓	-	✓
Market Risk	A&L	Equity Position Exposure	-	✓	-	✓	-	✓	✓	✓	-	✓
	Risk	Market Risk VaR Analysis	-	✓	-	-	-	✓	✓	-	-	
	Risk	Value At Risk Analysis	-	✓	-	-	-	✓	✓	-	-	
	Risk	Equity Exposure Analysis	-	✓	-	-	-	✓	✓	-	-	
	Risk	Product Risk Analysis	-	✓	-	-	-	✓	✓	-	-	
Liquidity Risk	Risk	Liquidity Risk Monitoring	-	✓	-	-	-	✓	✓	-	-	
	Risk	Liquidity Risk Regulatory Standards	-	✓	-	-	-	✓	✓	-	-	
	Risk	Liquidity Risk Analysis	-	✓	-	✓	-	✓	✓	-	✓	
Structure Of Capital	A&L	Capital Allocation Analysis	-	-	-	✓	-	✓	✓	✓	-	✓
	Comp	Financial Capital Adequacy Analysis	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Comp	Structure Of Regulatory Capital Analysis	-	-	-	✓	✓	-	✓	✓	✓	✓
	A&L	Financial Management Accounting	-	-	-	✓	-	✓	✓	✓	-	✓
	Prft	Business Procedure Performance Measurement	-	-	-	✓	-	✓	✓	✓	-	✓

Figure 4. Coverage across the three Basel II/III pillars in the Analytical Requirements

Supportive Content is available for each specific risk component as defined in the Basel II/III Framework. This includes:

- Capital Adequacy & Capital Ratios
- Capital Adequacy Framework (CAF) Final Rule
- Concentration Risk
- Counterparty Credit Risk (CCR)
- Credit Risk - Internal Ratings Based (IRB)
- Credit Risk - Standardized Approach
- Effective Maturity (M)
- Expected Loss (EL) And Provisions
- Exposure At Default (EAD)
- Global Capital Framework
- Liquidity Risk Management
- Loss Given Default (LGD)
- Market Risk – Internal Model
- Market Risk – Standardized
- Market Risk Capital Requirement
- Market Risk Incremental Risk Charge (IRC)
- Operational Risk
- Probability of Default (PD)
- Securitization Framework
- Stress Testing & Scenario Analysis
- The First Pillar – Minimum Capital Requirements
- Systemic Risk

Each module gives a complete breakdown of the data requirements of each risk component, as it is defined in the Basel II/III Framework documentation. In addition, there are detailed mappings from each module member to the equivalent model entities and attributes.

Supportive Content assist financial institutions in their analysis of the overall requirements of each risk component for their specific needs. Once this analysis is complete, the financial institution maps these risk requirements back to the models and identifies the data warehouse subset that is needed to support the data for their Basel II/III risk calculation needs.

Support is included for:

- Capital requirements for the trading book
- Complex securitization exposures
- Capital requirements for stressed value at risk (sVaR)

The detailed list of Supportive Content objects to address the above requirements include:

- Application Modules Market Risk - Incremental Risk Charge (IRC)
- Market Risk - Internal Model
- Market Risk - Standardized and Market Risk Capital Requirement

Project Scopes

Project scopes are a series of business subject area views that span across all models, giving users a clear understanding of the data coverage that is required in Analytical Requirements for specific business requirements or in Supportive Content for specific data calculation input requirements. An extensive set of project scopes specific to Basel II/III are included. These Basel II/III project scopes address the specific reporting requirements as identified in the Pillar III tables for quantitative disclosures, as well as covering other reporting requirements to help the Supervisory Review for Pillar 2.

The Project Scopes also identify specific data elements that are required for Pillar 1 Risk Calculations on the Supportive Content. Certain elements in the Supportive Content are common to many risk calculations. However, some sub-elements are specific to a particular calculation requirement only. Supportive Content is structured to show reuse of the components and the project scopes highlight the subset of those elements that are required for a particular calculation.

Each Project Scope is anchored on a particular Analytical Requirement or Supportive Content, but only selects the subset of elements that are specifically needed to address the particular Basel II/III data or reporting requirement. The scope of each Project Scope can then be extended using the predefined mappings between the Analytical Requirements, Supportive Content, and Atomic or Dimensional Models. In this way, the subset of the data warehouse that is required to support a particular project can be identified.

<p>Views Supporting Basel II Pillar 1</p> <ul style="list-style-type: none"> Basel II P1 CCR Current Exposure Method CEM Basel II P1 CCR Internal Model Method IMM Basel II P1 CCR Standardized Method SM Basel II P1 Counterparty Credit Risk Basel II P1 Effective Maturity Basel II P1 Expected Loss & Provisions Basel II P1 Exposure At Default Basel II P1 IRB Credit Risk Basel II P1 Loss Given Default Basel II P1 Operational Risk Basel II P1 Probability Of Default Basel II P1 Securitization Framework Basel II P1 Short-Term MA In IRB Approach Basel II P1 Standardized Cntrpty Risk Weights Basel II P1 Standardized Risk Weighted Assets Basel II P1 Treatment Of Double Default <p>Views Supporting Basel II Pillar 2</p> <ul style="list-style-type: none"> Basel II P2 Collateral Management Basel II P2 Credit Loss Allowance Analysis Basel II P2 Economic Capital Allocation Basel II P2 Involved Party Exposure Basel II P2 Location Exposure Basel II P2 Non Performing Loan Analysis Basel II P2 Operational Risk Assessment Basel II P2 Operational Risk Loss Analysis Basel II P2 Outstandings Analysis Basel II P2 Portfolio Exposure Basel II P2 Revolving Credit Facility Sortzn 	<p>Views Supporting Basel II Pillar 3</p> <ul style="list-style-type: none"> Basel II P3 T 1 Scope Of The Application Basel II P3 T 2 Capital Structure Basel II P3 T 3 Capital Adequacy Basel II P3 T 4 Allowance for Credit Losses Basel II P3 T 4 By Sector Or Counterparty Type Basel II P3 T 4 Credit Risk Exposure Detail Basel II P3 T 4 Geographic Breakdown Basel II P3 T 4 Impaired Loan & Allowance Basel II P3 T 4 Maturity Breakdown Basel II P3 T 5 Credit Risk Portfolio IRB Basel II P3 T 5 Credit Risk Portfolio STD Basel II P3 T 6 Counterparty Credit Risk Basel II P3 T 6 Credit Risk IRB Basel II P3 T 6 Credit Risk IRB Equity Basel II P3 T 6 Credit Risk IRB Retail Basel II P3 T 6 Credit Risk Losses IRB Basel II P3 T 6 Credit Risk Losses IRB Advanced Basel II P3 T 7 Credit Risk Mitigation Basel II P3 T 9 Securitization Disc Banking Bk Basel II P3 T 9 Securitization Disc Trading Bk Basel II P3 T 9 Securitization Disclosure Basel II P3 T 9 Securitization Early Amrtzn Basel II P3 T10 Capital Adequacy Disclosure STD Basel II P3 T11 Capital Adequacy Disclosure IMA Basel II P3 T11 Operational Risk Standardized Basel II P3 T12 Operational Risk Basic Basel II P3 T13 Equity Disclosure Banking Book Basel II P3 T14 Interest Rate Risk Banking Book 	<p>Views Supporting Basel II Pillar 1</p> <ul style="list-style-type: none"> Basel II - Revisions To Market Risk Framework Basel II Trading Book Incremental Risk <p>Views Supporting Basel III Pillar 1</p> <ul style="list-style-type: none"> Basel III Liquidity Risk Management Framework Basel III Liquidity Risk Monitoring Basel III Liquidity Risk Regulatory Standards Basel III The Global Capital Framework <p>Views Supporting Basel III</p> <ul style="list-style-type: none"> Basel II Advanced Capital Adequacy Framework. Basel II Standardized NPR Basel III Backtesting CCR Models Basel III Global Systemic Important Banks Basel III Regulatory Standards LCR
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Figure 5. Basel II/III Project Views

Support for International Directives Based on Basel II / III

International Capital Adequacy Framework

As Basel II defines Capital Adequacy Framework (CAF), the regulatory authorities in each jurisdiction interpret and specialize those Basel II/III rules for their own market and use it as an influence to enhance their existing CAFs. IBM Banking and Financial Markets Data Warehouse supports many major directives, as explained below. While this section focuses on the directives in some of the major jurisdictions, it has been designed to support the general requirements of Basel II/III and therefore the basic requirements of other jurisdiction directives will also be met.

European Capital Requirements Directive

The Committee of European Banking Supervisors (CEBS) is an advisory body of the European Commission on banking policy issues, currently focusing on the implementation of the Capital Requirements Directive (CRD). The CRD sets out new rules on capital requirements for financial institutions and investment firms with the aim of making sure that financial institutions' capital is more closely aligned with the risks they face. IBM Banking and Financial Markets Data Warehouse has extensive support for the data requirements of the CRD as they are closely aligned with the data requirements defined in Basel II/III. It offers extensive support for the capture of information such as the capital requirements, risk-weighted asset, and exposure details including parameters for:

- Probability Of Default (PD)
- Maturity (M)
- Exposure At Default (EAD)
- Loss Given Default (LGD)
- Expected Loss (EL) calculations

Also covered are the approaches to:

- Credit Risk
- Operational Risk
- Securitization and Equity Risk
- Financial Instruments
- Counterparty details
- Credit Risk Mitigation (CRM)
- Eligible Collateral Management
- Rating Agencies
- External, Internal and Inferred Ratings
- Risk Scores
- Risk Weights
- Account Status
- Portfolios
- Securitizations
- Operational Risk information, including: Business lines, Event types, Gross exposure amounts, Write-offs and recoveries, Assessment information, Loss information

Refining the Capital Requirement for Market Risk

Support is included for Incremental Risk in the trading book, as follows:

- Support for the revisions that are detailed in the Basel Committee on Banking Supervision (BCBS) directive Guidelines for computing capital for incremental risk in the trading book (BCBS 159, July 2009) have been made in this release. A new Analytical Requirement for Basel II, Incremental Risk in the Trading Book, has been added to support the above Basel II specification.
- For Market Risk, Incremental Risk Charge (IRC), a Supportive Content module containing data items that are required for the calculation of a capital charge to the financial institution's trading book that is incremental to the firm's general market risk (GMRC) and specific risk charges (SRC).

Enhancements to market risk framework include:

- Support for the revisions that are detailed in the BCBS directive Revisions to the Basel II market risk framework - final version July 2009, which have been made in this release.
- Market Risk Capital Requirement Supportive Content module containing data items that are required for the calculation of total market risk capital charge to the financial institution's trading book using the stressed VaR approaches.

Basel III - Liquidity Risk Management, New Capital Requirements and Changes to Counterparty Credit Risk

IBM Banking and Financial Markets Data Warehouse has been enhanced to include support for the BCBS directives:

- Basel III – International framework for liquidity risk measurement, standards, and monitoring
- Basel III – The liquidity coverage ratio and liquidity risk monitoring tools (including the LCR section of the monitoring workbook).
- Basel III – A global regulatory framework for more resilient financial institutions and banking system

Under this requirement, regulatory liquidity risk reports must be produced at least monthly to be delivered weekly or even daily when required by regulators. The challenge financial institutions will therefore face is to consolidate exposures, liabilities, counter parties, and market data in a centralized risk data warehouse, while identifying the subset of that information that must be reported daily. All contractual cash flows in portfolio should be made available and financial institutions should have the ability to stress those and produce liquidity gap analysis according to various scenarios. The LCR run-off rates as well as Net Stable Funding Ratio (NSFR), Available Stable Funding (ASF) and Required Stable Funding (RSF) factors depend on such information, which is usually only available in risk-specific data warehouses and not in treasury systems.

BCBS monitor the impact of Basel III regulations by providing a monitoring workbook, which participating financial institutions complete and submit on a semi-annual basis. Areas that are monitored in this workbook include definition of capital, leverage ratio, LCR and NSFR. The Supportive Content module Liquidity Coverage Ratio (LCR) presents the LCR

critical data elements as they are structured in the workbook using the same language, description, and level of detail. These critical data elements are of significant interest to financial institutions and can be used to aid the monitoring the LCR on an on-going basis and in line with Basel III regulations.

The next challenge financial institutions face is to interface their current risk and finance systems with third-party risk engines to meet the Basel III LCR requirements. Different LCR ratios have to be produced per consolidation level and currencies under varied idiosyncratic stress scenarios. Support is included for the above KPIs and reporting requirements, using Analytical Requirements to identify and document the individual elements that are required in the reports.

The following Analytical Requirements provide support for the Basel III requirements:

Short Term Liquidity Analysis - Promotes resilience over short-term time horizons by creating more incentives for financial institutions to fund their activities with more stable sources of funding on an ongoing structural basis.

Long Term Liquidity Analysis - Promotes resilience over long-term time horizons by creating more incentives for financial institutions to fund their activities with more stable sources of funding on an ongoing structural basis.

Liquidity Risk Monitoring - Reports the metrics, which help consistent monitoring of financial institution's liquidity. These metrics capture specific information that is related to a financial institution's cash flows, balance sheet structure, available unencumbered collateral, and certain market indicators.

Foreign Currency LCR Analysis - Captures potential currency mismatches, financial institutions, and supervisors should monitor the LCR in significant currencies. This allows the financial institution and the supervisor to track potential currency mismatch issues that might arise. Foreign currency LCR = stock of high-quality liquid assets in each significant currency/total net cash outflow over a 30-day period in each significant currency. Note that the number of total net foreign exchange cash outflows should be net of foreign exchange hedges.

Available Unencumbered Assets - Provides supervisors with data on the quantity and key characteristics, including currency denomination and location, of financial institutions' available unencumbered assets. These assets can be used as collateral to raise more secured funding in secondary markets and eligible at Central Banks and as such can be more sources of liquidity for the financial institution.

Financial institutions are to report the amount, type and location of available unencumbered assets that might serve as collateral for secured borrowing in secondary markets at prearranged or current haircuts at reasonable costs. Likewise, financial institutions should report the amount, type and location of available unencumbered assets that are eligible for secured financing with relevant Central Banks at prearranged (if available) or current haircuts at reasonable costs, for standing facilities only, i.e., excluding emergency assistance arrangements. This includes collateral that has already been accepted at the Central Bank but remains unused. For assets to be counted in this metric, the financial institution must have already put in place the operational procedures to monetize the collateral.

In addition to providing the total amounts available, financial institutions should also report these items that are categorized by significant currency. Significant currency is defined as available unencumbered collateral denominated in a single currency, which, in aggregate, amounts to more than 1% of the associated total amount of available unencumbered collateral (for secondary markets and/or Central Banks). Financial institutions must also report the estimated haircut that the secondary market and relevant Central Bank would require for each asset. In the case of the latter, a financial institution would be expected to reference, under business as usual, the Central Bank haircuts it would normally access, which is likely to involve matching funding currency, such as ECB for Euro-denominated funding and Bank of Japan for Yen funding.

As a second step after reporting the relevant haircuts, financial institutions should report the expected monetized value of the collateral rather than the notional amount and where the assets are actually held, in terms of where in the world the assets are and what business lines have access to those assets.

Contractual Maturity Mismatch - Analyzes the gaps between the contractual inflows and outflows of liquidity for defined time bands. These maturity gaps indicate how much liquidity a financial institution would potentially need to raise in each of these time bands if all flows occurred at the earliest possible date. This metric provides insight into the extent to which the financial institution relies on maturity transformation under its current contracts.

Concentration Of Funding - Identifies the sources of wholesale funding that are of such significance that withdrawal of this funding might trigger liquidity problems. The metric thus encourages the diversification of funding sources.

Liquidity Gap Analysis - Analyzes the net liquid assets of a financial institution. The excess value of the financial institution's liquid assets over its volatile liabilities. A company with a negative liquidity gap should focus on their cash balances and possible unexpected changes in their values.

Liquidity Position Analysis - Analyzes the difference between the sum of liquid assets and incoming cash flows on one side and outgoing cash flows resulting from commitments on the other side, which is measured over a defined period, being the measure of the liquidity risk.

Basel III - Global Capital Framework - Capital Requirements

- Supports is included for the new KPIs reflected using analytical requirement Economic Capital Analysis.
- Breakdown of Basel III capital structure is reflected in the Supportive Content module Total Regulatory Capital.
- Financial Institution Summary tracks the Basel III capital structure, conservation/additional buffers, and capital adequacy ratios.

Basel III - Global Capital Framework - CCR

- Supports is included for the creation of new Supportive Content application, CCR to support breakdown of CCR calculation parameters. Supportive Content module - CVA Risk Capital Charge shows the parameters that are needed to calculate the capital charge for CCR.

- Supportive Content module – Advanced Risk Capital Charge & Standardized Risk Capital Charge using IMM approaches
- CCR Capital Charges Summary measures the Counterparty Credit Risk that the counter party to an over-the-counter (OTC) derivative or a repo-style transaction will default.

BIS continues to monitor the provision against losses for financial institutions and continues to issue regulatory requirements to safeguard the banking world. IBM Banking and Financial Markets Data Warehouse provides a comprehensive solution for not only helping financial institutions to adhere to the demands in connection with Basel II/III reporting, but also builds on top of these requirements to provide financial institutions with sources for insight that drives better decisions for prudent management of financial Institution.

Support for Basel Risk Data Aggregation

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 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.

Further detail on BFMDW support for Risk Data Aggregation can be found in the whitepaper: "IBM Banking and Financial Markets Data Warehouse support for Basel Risk Data Aggregation." (IMW14805-USEN-00)

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