



**Banking Data Warehouse support for
International Financial Reporting
Standards (IFRS) including the
International Accounting Standards
(IAS)**

**BDW Version 3.4
and the
IFRS / IAS**

Whitepaper

December 2005

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About this Paper

The purpose of this paper is to outline the components of the IBM Banking Data Warehouse (BDW) and how these assist financial institutions to address the data modeling and data consolidation issues of the International Accounting Standards (IAS). The standards and interpretations adopted by the International Accounting Standards Board (IASB) in Bound Volume 2005, and used in the development of BDW, include:

- (a) International Financial Reporting Standards;
- (b) International Accounting Standards (IAS); and
- (c) Interpretations originated by the International Financial Reporting Interpretations Committee (IFRIC), formerly the Standing Interpretations Committee (SIC).

This paper is divided into the following chapters:

Chapter 1, “**Data Integration and the Banking Data Warehouse**”

Chapter 2, “**Banking Data Warehouse Components**” outlines each of the BDW components.

Chapter 3, “**BDW Components and the IFRS / IAS Architecture**” describes briefly an overall functional architecture for IFRS / IAS and how each of the BDW components fit into this architecture.

Chapter 4, “**BDW Support for the IFRS / IAS Bound Volume 2005 and the Development of the Standards**” summarizes the latest updates in BDW version 3.4 and how they address the IFRS / IAS Bound Volume 2005 and how the FSSC has contributed to the production of the International Financial Reporting Standards General Purpose (IFRS-GP) Taxonomy.

Chapter 5, “**BDW Support for XBRL**” describes at a highlevel an overall functional architecture for BDW supporting XBRL.

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Data Integration and the Banking Data Warehouse

Financial institutions are facing a series of related risk and compliance challenges. These include:

- Basel II
- IFRS / IAS

Executive management and regulators want a coherent view of both risk and financial data

The pace of change driven by the compliance challenges will be 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 Asset and Economic Capital calculations should eventually become a key driving force for decisions within the financial institution.

Risk Weighted Asset and Economic Capital calculations should eventually become a key driving force for decisions within financial institutions

The long-term business of a financial institution is dependant on maximising return on capital. Risk Weight Asset and capital calculations may be utilised 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 and so becomes the driver for marketing and relationship management.

There is a need to align the data structures that drive risk and financial data. These are:

1. **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
2. **Asset data** that covers all types of assets that might be linked to the transaction, the valuation of these assets and the correlation of asset behavior
3. **Customer data** for all counterparties which includes the credit risk of the counterparty and makes provisions when new information or circumstances changes that risk. Detailed data on customer is required to support product selection and pricing in addition to other relationship management decisions.

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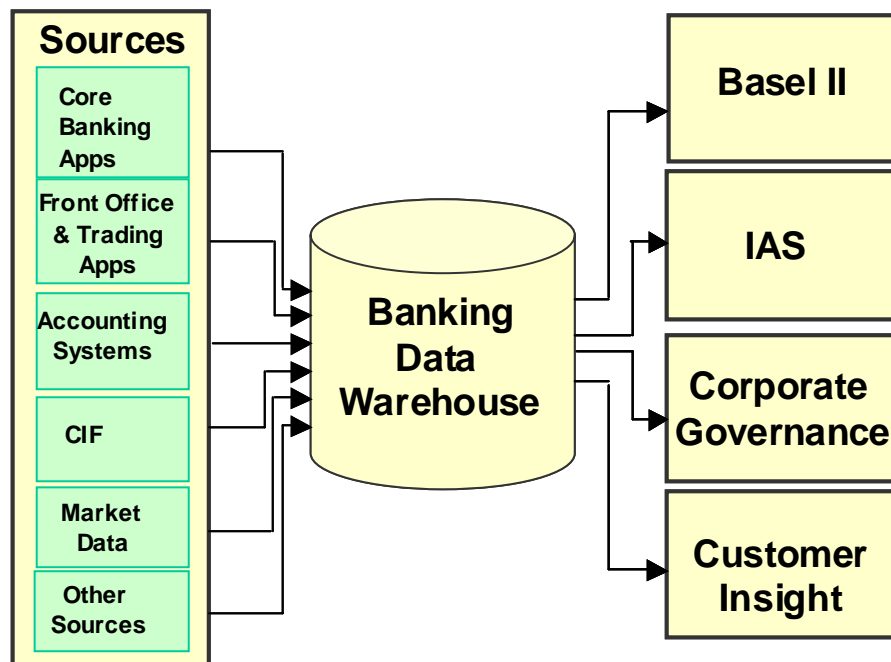
In an ever increasing competitive environment, financial institutions need a single view of their business information.

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

The Banking Data Warehouse is an enterprise-wide data architecture for a consolidated view of business data

The IBM Banking Data Warehouse (BDW) is a design for an enterprise data integration environment. BDW version 3.4 has comprehensive support for Basel II and IFRS / IAS in addition to all other areas of banking. Many financial institutions are now using BDW to support the integrated data requirements across all aspects of their business as represented below.



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With BDW 3.4 as the underlying architecture, the financial institution can now leverage all the advantages of an integrated data hub

The benefits of using the BDW as the financial institution's data integration hub with a single consolidated view of data include:-

- Integrated risk and compliance information
- Increased flexibility to address new requirements
- Faster response to new requirements
- Ability to better leverage data across lines of business
 - increased cross sell opportunities
 - Increased Know Your Customer ability in Customer Insight and Operational and Credit Risk.
- Increased consistency in data usage
- IT cost savings due to a reuse of population, storage and reporting components

More information on the Basel II aspect of BDW may be found in the Whitepaper:-

Banking Data Warehouse Support and the International Convergence of Capital Measurement and Capital Standards: A revised Framework (BDW33027)

Additional information on BDW can be found in the **BDW General Information Manual**.

These documents may be requested by emailing 3ifwhelp@ie.ibm.com

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Banking Data Warehouse Components

The IBM Banking Data Warehouse (BDW) enables financial institutions to build a platform to gather data across their IT solutions to suit their business intelligence, risk and management accounting and reporting needs. BDW has the flexibility to enable the creation of a range of data gathering solutions, from departmental data marts to enterprise-wide data warehouses.

The BDW comprises a proven, flexible and scalable data warehouse infrastructure to address the following business reporting and analysis needs:

- Profitability
- Relationship Marketing (CRM)
- Risk
- Asset and Liability Management
- Regulatory Compliance

The IBM Banking Data Warehouse content models are the cornerstone components of a financial institution's customized development of a data warehouse and business intelligence environment, and can be integrated with the bank's existing data mart or business information warehouse reporting environments.

BDW supports the data requirements of IFRS / IAS and it is currently being implemented to support these requirements on a number of projects. BDW provides comprehensive data coverage for all lines of business in a financial institution. It can be integrated with other application solution providers who deliver a complete solution to both the IFRS / IAS data and analytical requirements. The IFRS / IAS support within BDW is based on the Bound Volume 2005.

The BDW content models and the benefits that they provide are detailed in the remainder of this document.

Banking Data Warehouse is a proven, stable foundation for an IFRS / IAS data warehouse

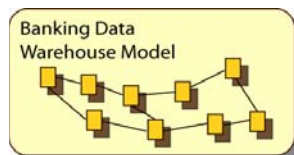
The full range of typical business issues are already encapsulated within the Banking Data Warehouse

Data from across the financial institution can be consolidated into the BDW

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Banking Data Warehouse Model (BDWM)



BDW Model provides a proven data architecture for both data consolidation and data reporting

The BDWM is a customizable data model that provides the historical and atomic data needed for a data warehouse and business intelligence infrastructure supporting multiple lines of business and analytical functions within medium to large financial institutions. The aim of this shared infrastructure is to provide a reusable platform and data structure environment that will reduce the development and operational costs in providing business intelligence functionality to the myriad of front and back office organization units. This is made possible by creating a data integration environment and leveraging this information for business intelligence, risk, management accounting and reporting. This way organizations can then focus on realistically managing the implementation of consistency of definition, transformation, and distribution of the data used for business intelligence across the lines of business.

Any technical requirements of the financial institution can be customized into the BDW

IBM provides a default physical database design, generated from the logical entity relationship data model. This physical data model incorporates IBM's vast experience in implementing data warehouse databases for the financial services sector, and could be implemented as is, to show how a data warehouse database should work. It is more likely though, that it will be customized further by a data warehouse design team of experts comprised of senior warehouse architects and database administrators, so as to ensure optimal configuration for the financial institution's data distribution and performance characteristics.

The BDWM contains the data structures needed by a financial institution to support the IFRS / IAS requirements.

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Many of the enhancements in BDWM Version 3.4 focus on the summarised data areas to handle the flow of data to and from risk and financial applications

BDWM includes:

- Accounting Structure Summary which is derived from Balance Sheet, Income Statement, Cash Flow and Statement of Changes in Equity line items.
- Financial Instrument Measurement Profile which tracks historical information related to the IAS 39 hedge measurement of Financial Instruments between given Effective and End Dates.
- Taxonomy Document which stores Financial Documents that represents a taxonomy which the Financial Institution utilizes for reporting purposes.
- Accounting Category which identifies a Classification that represents a standard category definition of accounting topics.

The following extensions to the accounting standards are **not** included in BDW Version 3.4 as the specific rules are not covered by the IFRS / IAS Bound Volume 2005.

- Industry Extensions
- Jurisdiction Specific Extensions
- Company Specific Extensions

However the BDW can be customized by users to incorporate these extensions as required.

Business Solution Templates



The Banking Data Warehouse contains over 90 Business Solution Templates (BSTs), reflecting the most common types of query and analysis for business performance measurement and reporting. The BDW also supports other analytical functions such as ad hoc reporting, data mining and decision support.

The BSTs have three main components:

- 1600+ reusable financial measures
- 370+ reusable financial dimensions of analysis
- 90 assemblies of the above measures and dimensions into reporting templates that can be easily customized for local requirements.

A set of reusable, industry best practice key performance indicators grouped by types of analysis specifically designed for financial institutions

Measures include, for example, the key performance indicators (KPIs) for a financial institution e.g. cash and balances with central banks, deferred tax assets, intangible assets. Each measure is fully defined and can be used either in its own right, or as a component contributing to another key performance indicator, which itself may contribute to other business performance measures. Where the measure is used in a formula, it is provided with a context sensitive calculation attribution e.g. in one formula, the measure may be summed into the total, whereas in another, it may need to be subtracted from the total. This reuse of measures ensures conformity of business measure use across the organization and is a key aid in the business metadata activities of a business intelligence environment within an organization.

During the analysis of the reporting requirements, the BSTs can be used to accelerate discussions with business users to provide rapidly prototypes of specific sample reports

Measures are used to drive value based behavior in an organization e.g. operating income and operating expenses by function. The BST dimensions provide the headings under which measures can be broken down and compared and from which the organizations behavior is monitored and tracked. Some 370 industry standard dimensions are supplied, with all members fully defined. As with the measures, calculation contribution attributions are provided to show how measures are aggregated along the dimension.

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Dimensions are reused in several reporting and analysis templates, thereby enforcing conformity of dimensions used in different analysis areas. This enables uniformity of reporting and the ability to cross reference measures from different areas of analysis; e.g. comparing profitability to risk measures across the same geographical and temporal breakdowns.

The BST's provide an existing set of grouping of measures and dimensions taken from the available pools, that capture an analytical need in a given business area e.g. issued capital, retained profits or accumulated losses. The supplied set of templates can be fully customized and/or new templates created in order to exactly reflect the needs of a particular financial institution. New measures and dimensions can also be added to their respective pools and incorporated into templates.

The BST's provided have been updated to provide structures to address all the latest IAS reporting requirements

Enhancements to the BST's in BDW for IFRS / IAS version 3.4 includes:

- Increased support for Balance Sheet including Classified Format, Order of Liquidity Format, Net Assets Format and Portfolio Basis
- Enhanced support for Income Statement by Function Format, Income Statement by Nature Format and Income Statement for financial institutions.
- Increased support for Cash Flows for both the Direct and Indirect Methods.
- Additional support for the Statement of Changes in Equity.

The BSTs now provide the underlying data structures to support IFRS / IAS Reporting as defined in the IFRS / IAS Bound Volume 2005. Specifically the BSTs support the production of the Consolidated Financial Statements.

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Business Solution Templates with BDW 3.4

<p>Relationship Marketing</p>		<ul style="list-style-type: none"> •Customer Interaction Analysis •Customer Investment Profile •Individual Customer Profile •Wallet Share Analysis 	<ul style="list-style-type: none"> •Customer Complaints •Delinquency Analysis •Customer Loyalty •Market Analysis 	<ul style="list-style-type: none"> •Campaign Analysis •Cross Sell Analysis •Customer Attrition •Customer Behavior •Lead Analysis
<p>Profitability</p>		<ul style="list-style-type: none"> •Transaction Analysis •Activity Based Costing Analysis •Insurance Product Analysis •Investment Arrangement Analysis 	<ul style="list-style-type: none"> •Profitability Analysis •Channel Profitability •Customer Lifetime Value •Customer Profitability •Location Profitability 	<ul style="list-style-type: none"> •Product Profitability •Product Analysis •Organization Unit Profitability •Performance Measurement •Business Procedure Performance
<p>Risk</p>		<ul style="list-style-type: none"> •Interest Rate Risk Analysis •Credit Risk Profile •Credit Risk Assessment •Credit Risk Mitigation Assessment •Securitization Analysis •Operational Risk Assessment 	<ul style="list-style-type: none"> •Outstandings Analysis •Portfolio Credit Exposure •Security Analysis •Liquidity Risk •Collections Analysis •Insurance Risk Profile 	<ul style="list-style-type: none"> •Authority Profiling •Credit Risk Analysis •Debt Restructuring •Involved Party Exposure •Location Exposure •Non Performing Loan •Operational Risk Loss Analysis
<p>Asset & Liability Management</p>		<ul style="list-style-type: none"> •Interest Rate Sensitivity •Liquidity Analysis •Short Term Funding Management •Financial Management Accounting 	<ul style="list-style-type: none"> •Capital Allocation Analysis •Capital Procurement •Credit Loss Provision •Funds Maturity Analysis •Income Analysis 	<ul style="list-style-type: none"> •Net Interest Margin Variance •Structured Finance Analysis •Equity Position Exposure •Position Valuation Analysis
<p>Compliance</p>		<ul style="list-style-type: none"> •European Central Bank Reporting •Financial Capital Adequacy Analysis •Structure Of Regulatory Capital •Foreign Financial Account Analysis •Suspicious Activity Analysis •Transaction Activity Analysis •SOX Balance Sheet Analysis •SOX Cash Flow Analysis •SOX Statement Of Change In Shareholders' Equity Analysis •SOX Statement Of Income Analysis 	<ul style="list-style-type: none"> •Balance Sheet Portfolio Basis Approach Analysis •Balance Sheet Classified Approach Analysis •Balance Sheet Order Of Liquidity Approach Analysis •Balance Sheet Net Assets Approach Analysis •Cash Flow Direct Analysis •Cash Flow Indirect Analysis 	<ul style="list-style-type: none"> •Cash Flow Direct Financial Institution Analysis •Cash Flow Indirect Financial Institution Analysis •Income Statement By Function Analysis •Income Statement By Nature Analysis •Income Statement Financial Institution Approach Analysis •Statement Of Changes In Equity Analysis

Application Solution Templates



The Application Solution Templates (ASTs) are designed to show how the data contents of the IFRS / IAS requirements would overlay on the BDW Model. While the BST's are concerned with showing how Reporting functions relate to the BDW Model, the AST's are concerned with showing how non-reporting components relate to the BDW Model.

The Application Solution Templates provide the initial scoping of data required to address IFRS / IAS 39 Measurement

A BDW Application Solution Template (AST) exists containing the data items required to support the calculation of Hedge Measurement according to the requirements of the International Financial Reporting Standards (IFRS) International Accounting Standard (IAS) 39 Financial Instruments: Recognition and Measurement.

Based on the category of the financial instruments and the specific primary financial statement line items stored in the BDW hierarchy, reconciliation can be achieved to meet auditors' requirements. This reconciliation is achieved by BDW interfacing with an IAS Measurement application utilizing the IAS Measurement AST. The calculated results are subsequently fed back to the BDW for downstream reporting.

The IFRS / IAS Measurement AST gives a breakdown of the data requirements of each IFRS / IAS 39 measurement component. The ASTs will be enhanced as the requirements for IAS 39 develop and become more mature. In addition there are detailed mappings from each AST member to the equivalent BDW Model entities and attributes.

BDW Project Views



The BDW Project Views provide a filtered view across the data mart and data warehouse structures for specific IAS Reporting requirements

The BDW Project Views are a series of business subject area views which span across all BDW components. The BDW Project Views give users a very clear understanding of the data coverage required for a specific business requirement, such as Liquidity Analysis, and assist in focusing in on only those data items in the BDW models that assist in solving the immediate business issue. BDW 3.4 includes an extensive set of Project Views specific to IAS. These IAS Project Views address the specific IFRS requirements.

Each project view is anchored on a particular reporting solution template, and only selects from that solution template the subset of measures and dimensions specifically needed to address the particular reporting requirement. The scope of each BDW Project View can then be extended to include the relevant pre-defined mappings that exist between the BST and the Banking Data Warehouse Model.

The following is a list of the IAS specific views in BDW version 3.4:

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Reporting Standards Supported

- International Accounting Standard (IAS) 1
- International Accounting Standard (IAS) 2
- International Accounting Standard (IAS) 7
- International Accounting Standard (IAS) 11
- International Accounting Standard (IAS) 12
- International Accounting Standard (IAS) 16
- International Accounting Standard (IAS) 18
- International Accounting Standard (IAS) 19
- International Accounting Standard (IAS) 20
- International Accounting Standard (IAS) 21
- International Accounting Standard (IAS) 23
- International Accounting Standard (IAS) 27
- International Accounting Standard (IAS) 28
- International Accounting Standard (IAS) 30
- International Accounting Standard (IAS) 32
- International Accounting Standard (IAS) 33
- International Accounting Standard (IAS) 38
- International Accounting Standard (IAS) 39
- International Accounting Standard (IAS) 40
- International Accounting Standard (IAS) ED 7
- International Accounting Standard (IAS) IFRIC
- International Accounting Standard (IAS) IFRS-CP
- International Accounting Standard (IAS) IFRS 3
- International Accounting Standard (IAS) IFRS 5

BDW Components and the IFRS / IAS Architecture

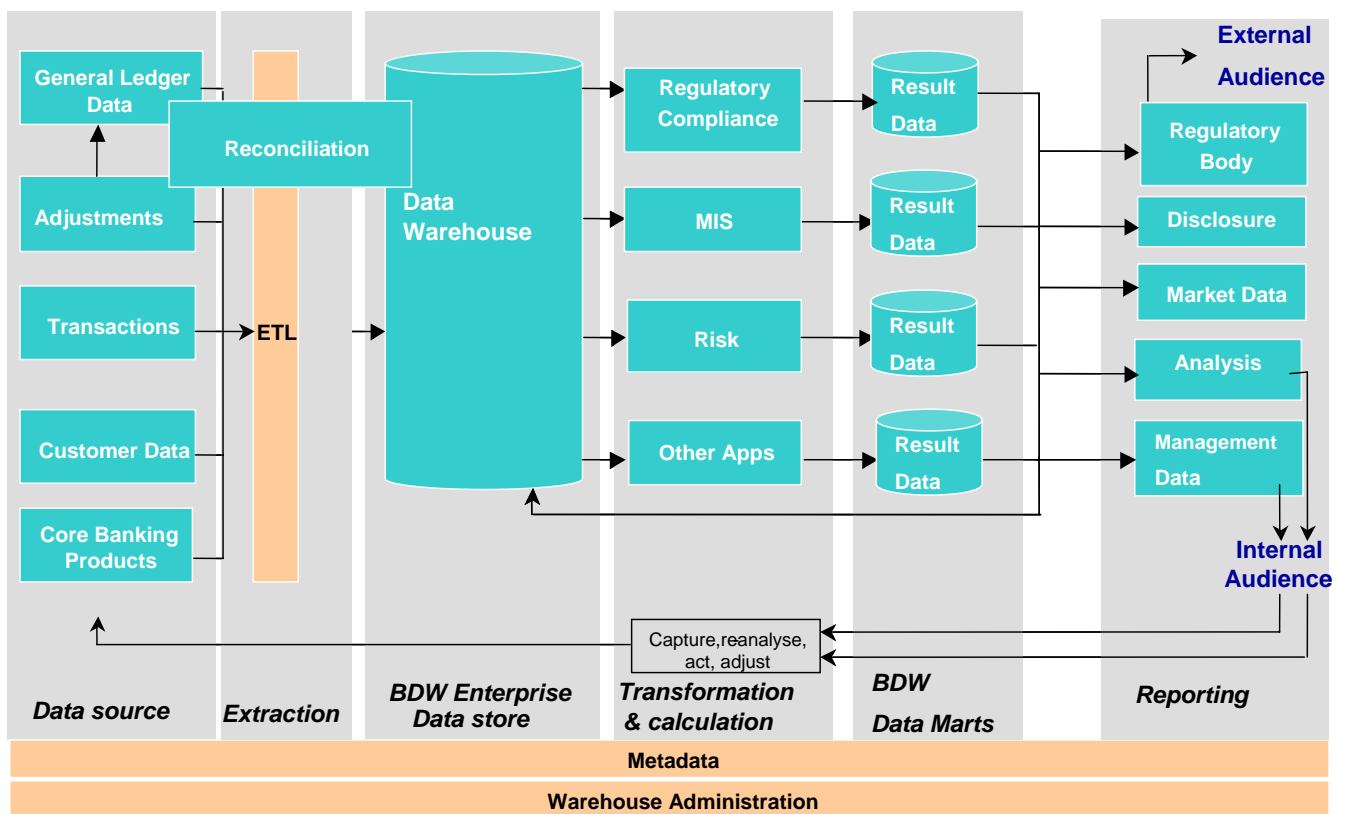
The BDW offering provides a set of integrated models to address all aspects of a data gathering structure for IFRS / IAS

The BDW 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 separate model components are delivered within an architectural structure known as the Information FrameWork. Within the Information FrameWork, elements of a model are mapped to corresponding elements in other models; e.g. a data mart base measure may be mapped to a BDW Model attribute that is the source for the data to be loaded into the data mart report. This maps the information required by a business user (measure) to the data storage maintained by a technical user (database attribute). By pre-solving problems such as these, the financial institution is left free to concentrate on the real management information and business intelligence issues:

- sourcing the data
- defining how it should be transformed and aggregated
- improving data quality management within the organization
- reconciliation of transaction, risk and financial data

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The figure above shows an outline IFRS / IAS architecture.

The IBM IAS Architecture provides a complete framework for all IFRS / IAS projects

This architecture outlines the six tiers of functionality needed to support IFRS / IAS

- Data Sources – the internal and external sources of all data required for IFRS / IAS and other compliance reporting requirements
- Extraction – the processes and technology 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 IFRS / IAS and other compliance reporting is gathered
- Transformation and Calculation – the area where the various IFRS / IAS calculations are performed
- Data Marts – the area where the aggregated data ready for reporting is stored
- Reporting – the actual creation and delivery of the reports to the various user groups including IFRS / IAS

A data warehouse is seen as the consolidation and the reconciliation point for all the necessary data as it is extracted from potentially many different sources

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The BDW components are designed to provide a financial institution with the means of building the most extensible and effective IFRS / IAS data structures

BDW supports these functional requirements in the following way.

- The BDW Model provides the design for the enterprise data store
- The Business Solution Templates provide the foundation for the required data mart structures for IFRS / IAS
- The BDW Project Views provide a filtered view across the data mart structures. Each view addresses specific reporting requirements defined in the latest IFRS / IAS documentation
- BDW supports the “handshaking” with an XBRL Framework regardless of whether it is the export of information in an XBRL format to a Regulatory Body or importing any feedback information e.g. Regulatory Body validation result data. This support is achieved via the Taxonomy Document Entity which stores Financial Documents that represents the IASB taxonomy. See Chapter 4 for further taxonomy information.

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BDW 3.4 is just one step of a constant evolution of data management best-practice for financial institutions

BDW will continue to evolve to match future IFRS / IAS requirements

BDW will continue to reflect the latest thinking, requirements and standards for Financial Reporting.

BDW Support for the IFRS / IAS Bound Volume 2005

IBM has been enhancing the BDW assets for support of the IFRS / IAS Bound Volume 2005 over a number of development phases. The main objective is to ensure that the IFRS / IAS specific enhancements are evolved into the BDW components. This allows financial institutions to take advantage of the existing and proven data management architecture while addressing their specific IFRS / IAS Requirements.

The BDW Model has complete atomic level structures in place to address all Primary Financial Statement mappings to specific IFRS / IAS rules specified in 2005 Bound Volume Documentation. As well as providing the necessary atomic data structures, the BDW Model has significant support required by IFRS / IAS for the data structures used for report generation of summarized data.

Whether financial institutions are using the BDW to address their IFRS / IAS requirements, or just wants to evolve their reporting capability to a higher level of maturity, they are building on a proven foundation that addresses these specific requirements. BDW is built using design principles founded upon a principle of an open technology architecture and incorporating relevant business standards.

FSSC and BDW Support for Standards Development

The FSSC which is the centre for development of the Banking Data Warehouse has a representative on the IFRS Taxonomy Working Group and has contributed to the production of the International Financial Reporting Standards General Purpose (IFRS-GP) Taxonomy May 2005. In addition, contributions were made to the first Financial Services Taxonomy Development workshops at the Banco de Espana, Madrid, in July 2004 and the internal IASB Definitions Links Database.

This FSSC support for standards development for financial reporting continues and helps to ensure that BDW reflects the latest thinking, requirements and standards in this area.

BDW is being selected as the IAS data gathering platform by many existing and new BDW customers

BDW Support for XBRL

What is XBRL?

eXtensible Business Reporting Language (XBRL), the financial and operational business reporting derivative of the Extensible Markup Language (XML), is a freely licensable open technology standard which makes it possible to:

- store / transfer data along with the complex hierarchies
- data-processing rules
- descriptions that enable analysis and distribution

XBRL makes data “smart.” It determines whether the information is segment information, part of an audited statement, or another type of business data. It supports the presentation, manipulation and allows the exchange of information using a set of standards and a family of taxonomies.

What is a Taxonomy?

A taxonomy is a description and classification system for the contents of financial statements and other business reporting documents.

XBRL Taxonomies represent

- individual business reporting concepts
- mathematical and definitional relationships
- text labels in multiple languages
- references to authoritative literature about how to display each concept to a user (Source: XBRL.org)

Why is the IASC Foundation Building a Taxonomy?

Under the IASC Foundation Constitution, the objectives of the IASB are to develop, in the public interest, a single set of high quality, understandable and enforceable global accounting standards that require high quality, transparent and comparable information in financial statements and other financial reporting to help participants in the world's capital markets and other users make economic decisions; to promote the use and rigorous application of those standards; to bring about convergence of national accounting standards and International Accounting Standards to high quality solutions. IASCF IFRS Taxonomy development is complimentary to these objectives. IFRS taxonomies assist the transfer of financial reporting information created pursuant to IFRS using the internet - according to a single common protocol developed by the IASCF.

BDW Support for XBRL

XBRL may be integrated with reporting applications from other vendors. BDW supports XBRL explicitly by storing XBRL Instance or Mapping Documents as BDW Documents. In addition BDW has the inbuilt capability to store historical versions of the XBRL Documents thus facilitating the production of previously generated reports.

The value of XBRL

Financial institutions can use XBRL to save costs and streamline their procedures for reporting financial information. Financial institution investors, analysts and regulators can receive, compare and analyse data much more rapidly and efficiently if it is in XBRL format.

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Financial Services Solution Centre
IBM Ireland Limited
Building 6
Dublin Technology Campus
Damastown Industrial Estate
Mulhuddart
Dublin 15
fssc@ie.ibm.com

The IBM home page can be found on the Internet at **ibm.com**

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