

IBM Industry Models for Financial Markets General Information Manual



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Executive Summary

Executive Summary

The financial markets industry is tackling two core challenges head on. The first is focused on its medium-to-longer term future, and the second is focused on its ability to respond to the challenges of efficiency, growth and resiliency in the short-to-medium term. Underscored by a recent IBM and the Economist research project, there is an emerging market bifurcation into companies who are risk providers and companies who assume risk. It's hard to escape from the overall message that risk is strategic to an organization's corporate intent and survival. Simply put, while the majority of profits are coming from equities, profit margins are shrinking but volume remains strong, so how can organizations remain profitable and grow? Potentially, the confidence to push an organization in one way or another has either to do with their need to become a full service provider, or the need to specialize. In either case, the longer-term future is built today by innovatively leveraging IT to solve key strategic business challenge such as providing solutions for governance, risk management and compliance, trade process transformation and enhancing the customer experience. Namely:

- Efficiency – streamlining trade processes, monitoring, and execution handling to reduce cost and accelerate execution time in the middle and back office, thereby simplifying and providing transparency.
- Differentiate for growth – delivering front office innovations that enhance the clients' experience through business process transformation and operational customer-centricity.
- Resiliency – agility to respond to threats through timely, intelligent financial reporting, and risk management solutions, which deliver insight into operational excellence, optimization of capital allocations and fraud identification.

Business Transformation

Taking a more proactive, enterprise-wide approach to managing compliance issues, will require organizations to leverage compliance and risk management in a way that creates new value for the business through greater transparency, better leveraged capital and increased trust. Greater transparency will be critical, not only because regulators and customers are demanding it, but also because of the emergence of collaborative business models and partnerships. Risk management and regulatory compliance require fast, accurate and complete data. The key for financial institutions will be to leverage compliance investments enterprise-wide by shifting the focus from implementing best-of-breed controls that solve specific problems to facilitating a decision-driven approach that helps the company grow revenue and profits, and manage the business more effectively.

IBM can help financial institutions tackle both ends of the risk equation by going beyond regulatory and compliance requirements to take a strategic approach to risk. Today's firms are being challenged to improve corporate decision making, optimize economic capital allocations and strengthen corporate control, resilience and compliance by facilitating the effective management, monitoring and control of risk. There has been a dramatic increase in focus on risk oversight and adopting a pro-active risk approach. Research conducted by IBM's Institute for Business Value shows that CROs state that their most important tasks are the development of policies and procedures, the monitoring of risk, and critically, the development of an Enterprise Risk Management culture. IBM can help a client execute faster, with increased reliability, in this dynamic marketplace.

The IBM Industry Models for Financial Markets

The Industry Models are a comprehensive set of financial markets specific models that represent good practice and are a natural extension to the GBS Component Business Model. Once you have started down the path of transforming to an On Demand Business and have identified components for your business, the Industry Models provide the financial markets specific business content that can accelerate your resultant IT projects.

The Industry Models describe the business of the financial institution and are an efficient communication bridge between business and technology communities. The entire framework available to financial markets organizations consists of:

- **The IBM Financial Markets Data Warehouse**, which provide an overall analysis and datawarehousing framework for handling risk management and regulatory compliance etc.
- **The IBM Financial Markets Process Models** are designed for financial markets organizations looking to re-engineer, broaden and standardize their core enterprise-wide business processes.
- **The IBM Financial Markets Services Models** are for organizations that are implementing new business process architectures, and for companies focused on their SOA strategy.

Consequently, IBM enables Financial Markets companies to roll-out a coherent enterprise architecture approach to addressing Anti Money Laundering, Basel II, Know Your Customer (KYC), Markets in Financial Instruments Directive (MiFID), Sarbanes Oxley Act (SOX) and Financial Management reporting.

The Industry Models typically support approximately 80% of business requirements and can be easily customized and extended to cover the specific requirements of a financial institution. They will assist a financial institution in implementing a flexible, reusable, extensible and easily customizable architecture, which in turn will enable it to:

- Be more adaptive and to respond quickly to changing customer needs
- Focus on achieving competitive differentiation
- Identify and leverage best practice behaviors across the organization

IBM Financial Markets Data Warehouse

The key capabilities of the models include:

- Consists of ready-to-use Analytical Requirements, business vocabulary, and enterprise data warehouse designs that can be implemented selectively, or as a whole.
- Embodies the relevant requirements from the Markets in Financial Instruments Directive (MiFID) such as the categorization of counterparties as retail or professional.
- Delivers extensive reporting templates for Basel II, Sarbanes Oxley Act and Investment Management.
- Supports analysis of financial transactions providing a single view of trades and associated reference data across the front and back offices. This covers topics such as position/exposure analysis, VWAP analysis and reporting on best execution.
- Contains integrated data model support for clients wishing to implement a data warehouse alongside an operational master data management solution for party data.

IBM Financial Markets Process Models and Service Models

The key capabilities of the process and service models include:

Delivers workflows for Know Your Customer (KYC), Account Opening and MiFID:

- Provides standardized processes across channels for quick identification of existing customers and their situation.
- Supports customer profiling from needs analysis, account profiling, and customer validations for KYC and Anti-Money Laundering (AML), account recommendation, to MiFID's suitability and appropriateness.
- Contains account setup details of the actual setting up of the account (documentation, communications and signatures, credit checks, account approval and activation, account manager and custodian assignment).

Enables Middle to Back Office Process Integration

- Delivers consistent integrated definition of process and data flows of the post-trade execution processes including the trade confirmation, the sending of the notice of execution to the customer, the allocation of execution across accounts, the calculation of fees and commissions, trade matching, the application of settlement instructions, trade confirmation and affirmation, and settlement.
- Considers all aspects of risk management and compliance monitoring across the overall process and data necessary for the post trade processing transformation. The actual processing will typically be performed by commercial or in-house applications.

Order Handling and Best Execution

- Supports MiFID requirements for process definitions covering the identification of best execution venues (or intermediaries), suitability and appropriateness, and order handling (including all validations and risk and limits)

Corporate Actions

- Corporate Actions are events that cause a material change to a corporation with an impact on its shareholders. Some examples are rights offerings, elective dividends, tender offers, bankruptcies, conversions, mergers, acquisitions, redemptions, spin-offs and periodic dividend. The process models address the typical issues such as receipt and dissemination of announcements, determining entitlement, calculating benefits, elections and the allocation of proceeds.

What are Industry Models?

The Industry Models are created by identifying, describing and structuring all of the business functions, data and processes that you would expect to find in a financial institution in such a way that it can be used to accelerate IT projects. These models ensure that business requirements for major initiatives are captured and expressed in a manner that can be understood by the IT organization and are reflected in all levels of the subsequent application development process.

By providing a set of pre-defined models, the Industry Models enable the scoping, specification, design and deployment of information solutions, which are:

- Faster, through use of generic model specifications and designs
- Cost effective, through reduced analysis costs and increased re-use of existing assets
- Better, through increased quality and consistency
- Lower risk, by building on good practice and by ensuring a strategic perspective

The Industry Models are valuable for initiatives such as:

- Corporate information architecture
- Data warehouse and mart development
- Services oriented architectures/enterprise application integration
- Business process re-engineering
- Information systems scoping and requirements definition
- Application systems package evaluation



Deploying the IBM Industry Models for Financial Markets

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

Using **IBM Information Management** software

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

Using **DB2 Information Management Software**

IBM DB2 Information Management Software products help financial institutions leverage their existing IT assets so they can maximize the value of their information with advanced Business Intelligence (BI) features for building and working with data warehouses and data marts. IBM's BI solutions enable companies to comb through vast quantities of data quickly, thoroughly and with sharp analytical precision. BI capabilities are built into the DB2 engine, and BI applications have DB2 at their core. The Industry Models provide financial markets-focussed data content, which can be deployed on IBM DB2 Information Management Software to address areas such as business intelligence. While the Industry Models help clients define and describe a unified view of their analytical data that persists in a data warehouse, in order for the analytical solution to work, IBM Information Server enables organizations to understand their existing data sources; to cleanse, correct and standardize information; and to load the information into the data warehouse.

Using **WebSphere** software

IBM WebSphere delivers application infrastructure and integration software that helps companies address key priorities in an on demand world. IBM WebSphere software delivers the ability to integrate disparate applications and systems in a flexible manner that speeds time to value and helps companies maximize the utilization of existing resources. The Industry Models provide standardized business processes and services definitions which can be deployed on IBM WebSphere software to address challenges such as provision of a services oriented architectures.

Using **Rational** software

Rational software helps organizations create business value by improving their software development capability. Rational software allows you to:

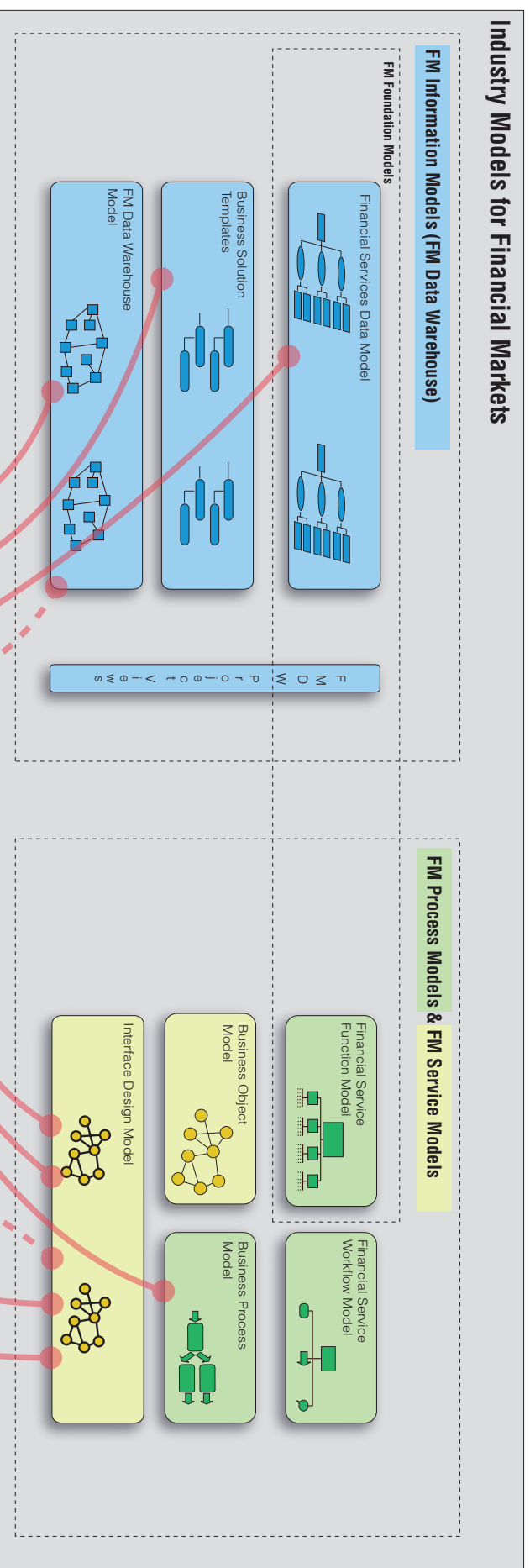
- Adopt iterative development practices that reduce project risk.
- Focus on architecture to develop more resilient systems.
- Effectively manage change and protect critical strategic assets.

Industry Models for Financial Markets - Positioning

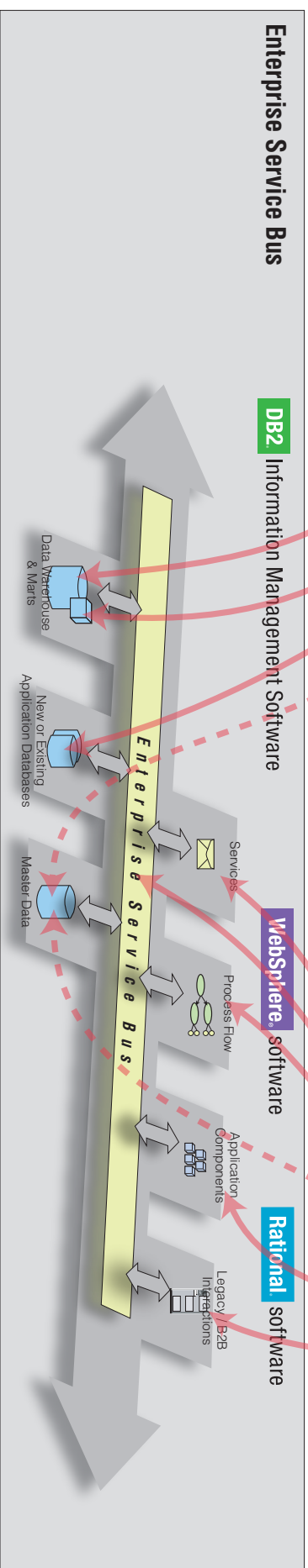
Component Business Model



Industry Models for Financial Markets



Enterprise Service Bus



The Financial Markets Data Models

How this document is structured

The Industry Models provide us with a tool whereby we can identify the important functions, activities and business concepts that make up a particular business issue.

The Financial Markets Data Models assist with creating a consistent enterprise view of information.

The Financial Markets Process Models assist with process simplification, standardization and business process re-engineering.

The Financial Markets Service Models assist in the creation of a services oriented architecture environment.

The IBM Financial Markets Data Warehouse (FMDW)

Information is one of the financial institutions most powerful assets. Enterprise data models enable higher data quality and completeness. Analytically, such models allow financial institutions to improve their focus on the profitability of different products and lines of business and to achieve targeted and more effective marketing for sell and cross-selling products and services.

The IBM Financial Markets Data Warehouse enables financial institutions to build data warehouse solutions to suit their specific needs. FMDW has the flexibility to enable the creation of a range of data warehouse solutions from departmental data marts to enterprise-wide data warehouses and includes all of the key components required for the core of a data warehousing solution.

The FMDW provides the blueprint for a single consistent enterprise view of the data. It is a proven solution with the scalability and flexibility needed to address existing and future data consolidation requirements and has pre-defined financial institution content.

FMDW Features:

- A data management toolkit designed to assist financial institutions in building warehousing solutions, analytical and operational.
- Rich data models for the full spectrum of the financial markets businesses
- Encourages financial institutions to adopt a business-focus when building an information management solution
- Save up to 80% of analysis costs by using predefined data model and templates
- Experience to minimize risks by supporting an iterative development approach to an enterprise wide solution
- Aligned to support industry issues e.g. regulatory compliance and customer insight.
- Delivers the performance and scalability to manage the customer information needs of a large financial enterprise
- Supports consistent access to customer information by all of the enterprise's business applications
- Provides a consistent customer experience

There are a number of models that form the Financial Markets Data Warehouse offering:

- The Financial Services Data Model
- The Financial Markets Design Model
- The Financial Markets Analytical Requirements
- The Financial Markets Application Solution Templates
- The Financial Markets Scopes

The Financial Services Data Model

The FSDM is an enterprise-wide classification model. It provides an enterprise-wide view of the concepts and information within the financial institution and forms the basis of an enterprise-wide information architecture. The fundamental purpose

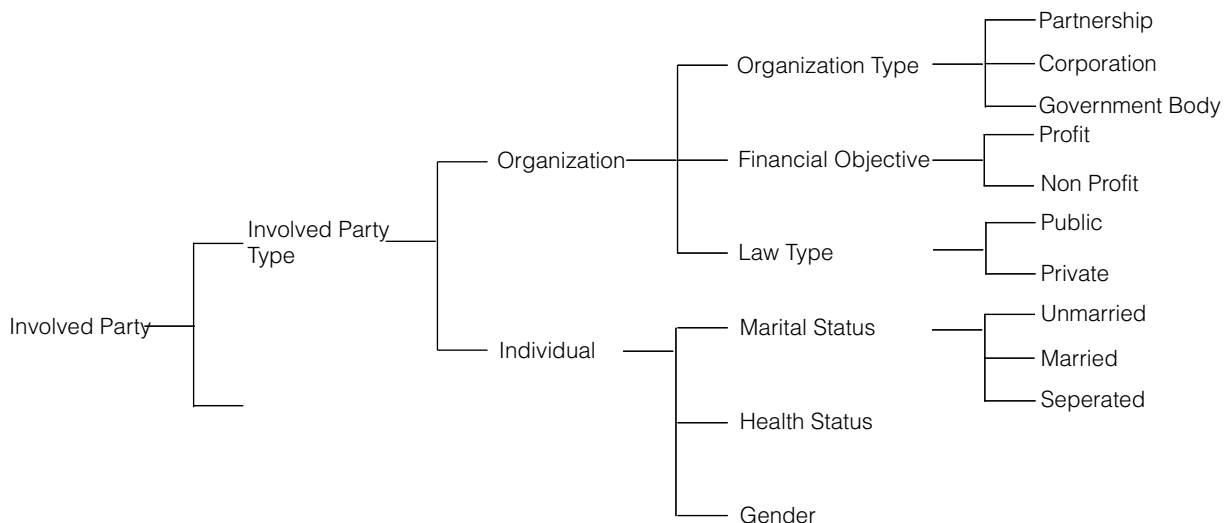
of the FSDM is to enable business concepts to be clearly understood and communicated and as a result help accelerate project scoping.

Take the question of what is meant by “Customer” in a particular business context. “Customer” could include such concepts as:

- Identifying a specific person or organization
- Knowing all addresses the customer uses
- Knowing all products the customer is using
- Knowing which market segments the customer belongs to
- Knowing about the customers recent transaction history
- Knowing about the customers complaint history

Depending on the business context, the meaning of “Customer” could imply some or all of these concepts.

The FSDM provides a detailed classification structure that can be used to define precisely what is meant by, for example, “Customer”. in the current context. For example, a financial institution may be introducing a major new customer relationship management initiative. Precisely what “Customer” means in this context, may be quite different to what “Customer” means as far as the current call center operations are concerned. The FSDM helps clarify these different perspectives.



How the FSDM is used

Managing the Enterprise Data Resource

Key to effective enterprise data resource management is the ability to consistently define the business meaning of data elements. Without this ability, the elements within the data resource cannot be identified, compared and contrasted in order that overlaps, redundancies, impacts and ownership can be highlighted and resolved. By mapping high priority databases to the FSDM, it is possible to understand their content and manage them effectively.

Agreeing on the scope of an initiative or application

Throughout the whole development lifecycle, the incorrect or inaccurate definition of the scope of a business initiative or system application is the most expensive error to correct. Often, agreeing the scope can be a time consuming process as stakeholders bring their own perspective and language to the discussion. Lack of complete understanding of the subtleties of a particular initiative can lead to major problems and costs later in the development process. The FSDM is a key tool for rapidly, consistently and completely defining (and communicating) the scope of an issue.

Carrying out impact and gap analysis

If a new initiative is scoped using the FSDM, and the FSDM has been previously scoped to existing or other proposed initiatives or applications, then comparing these scopes within the FSDM provides an immediate and detailed indication of the overlaps and gaps in the data aspects of these initiatives or applications.

Deriving logical specifications

Once an issue has been scoped within the FSDM, a simple methodology can be employed to convert the scoped area of the FSDM from a set of classification hierarchies into a more traditional Entity-Relationship Model that can then be used as a basis for database design.

Data warehouse planning

The FSDM is used in two major ways during a data warehouse development project:

- The scope of the project can be defined within the FSDM and then that scope projected to the central warehouse (for example the FMDW)
- The FSDM can be mapped to applications that are potential sources of data for the warehouse. A scoped set of items within the FSDM can be mapped both to items within the warehouse items and potential sources for those items.

Benefits of the FSDM

- Provides a predefined, readily customizable enterprise data model
- Provides enterprise-wide definitions of concepts and data
- Forms part of a common language between business and IT
- Provides a rapid and accurate scoping tool for new initiatives - saves time and cost
- Reduces data redundancy by providing transparency as to the meaning of data items
- Encourages re-use and consistent data structures across the enterprise

The IBM Financial Markets Design Model

The Financial Markets Design Model is a 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 single point of data 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.

The Design Model provides financial institutions with both the content and the infrastructure to support the provision of clean, rationalized and easily accessible data from a central information repository. It allows financial institutions to exploit the potential of information previously locked in legacy systems and inaccessible to the business user.

The Design Model is a logical model consisting of 80% or more of the data structures typically needed by a financial institution for its data warehouse. Once it has been customized to meet the requirements of the financial institution, this model can be automatically generated into the physical data warehouse database.

Financial Markets Design Model Features

- A single overall data architecture for enterprise wide storage of consolidated data needed for compliance, enterprise risk management and business performance
- Has structures to handle the storage of raw detailed data from many sources
- Financial markets specific structures to handle financial instruments, risk mitigation instruments, customer / transaction details
- Pre-defined aggregations to support key indicators in areas such as Investment Management, Risk Management and Regulatory Compliance

How the Financial Markets Design Model is used

Central Warehouse Scoping and Design:

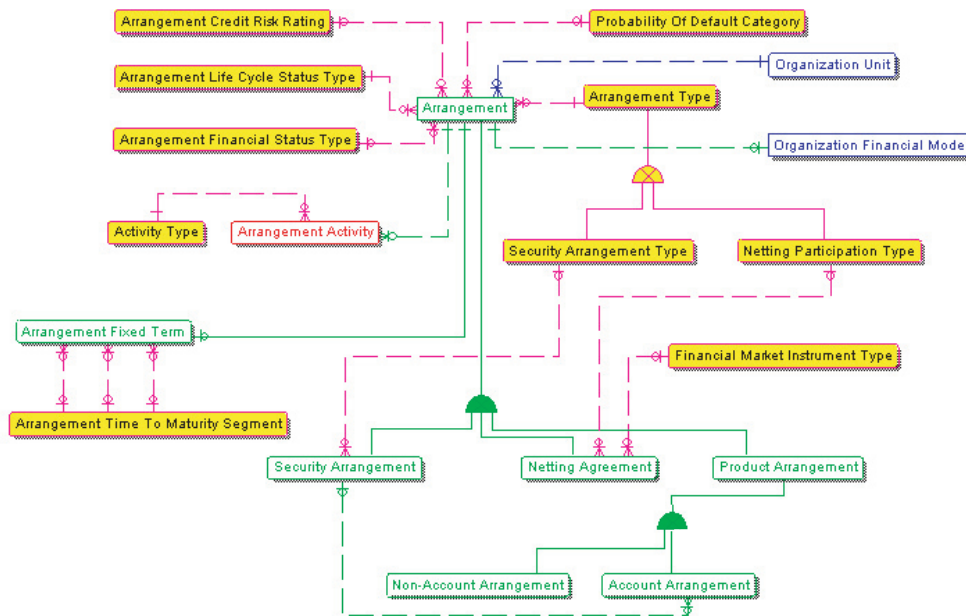
The FMDWM provides the blueprint for a design of a central business data warehouse database structure. The model assists in the creation of a flexible and extensible data warehouse specific physical database.

Consistency of Data Mart Architecture:

The Design Model provides a logical reference point for the consolidation of data definitions and structures across a number of data marts.

Data Mart Design:

The Design Model provides a starter set for the design of a prototype data marts. In this case the structure would have to be optimized for the performance of end-user delivery functions.



Example of the FMDWM

Benefits of the Design Model

- Provides complete data warehouse database structure for financial market organisations
- Enables financial market organisations to address the infrastructure and storage issues for multiple requirements from a single blueprint
- Promotes the standardization of data across the enterprise
- Delivers competitive advantage by providing consolidated data for MIS, Risk and Financial Reporting
- Flexible enough to address future report requirements across all areas (risk, regulatory, etc.)
- Enables business users to more effectively control the definition and scoping of the data warehouse solution

The Financial Markets Analytical Requirements

The Analytical Requirements comprise a set of templates that allow business managers to quickly and easily define the reporting structures needed to access key information. These Analytical Requirements include key performance indicators grouped by functional reporting and provide the basis for rapid customization and prototyping of reporting requirements into

a range of reporting environments. The Analytical Requirements cover three major areas of financial markets information:

- Asset & Liability Management
- Regulatory Compliance
- Risk Management
- Investment Management

Asset & Liability Management

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

Regulatory Compliance

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

Risk Management

Credit Risk Assessment	Credit Risk Mitigation Assessment
Operational Risk Assessment	Operational Risk Loss Analysis
Collections Analysis	Credit Risk Analysis
Customer Credit Risk Profile	Debt Restructure Analysis
Non Performing Loan Analysis	Outstandings Analysis
Liquidity Risk Analysis	Location Exposure
Interest Rate Risk Analysis	Involved Party Exposure
Portfolio Credit Exposure	Securitization Analysis
Security Analysis	Authority Profiling
Value at Risk Analysis	Integrated Rist Management

Investment Management

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

Wealth Management

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

How the Analytical Requirements are used

Data mart and Data Warehouse Scoping and Design

The information analysis and management reporting aspects of a particular topic are scoped within the dimensions and measures that make up the Analytical Requirements. The scoped Analytical Requirements can then be used to specify the design of an appropriate physical data mart structure, and can also identify those areas of the FMDWM central warehouse that must be implemented in order that the data marts can be provided with necessary information from the central warehouse.

Benefits of the Analytical Requirements

- Business users can more rapidly and effectively control the definition and scoping of a data mart solution
- Provides a consistent structure and consistent reporting for data marts generated from scoped portions of the Analytical Requirements
- Enables accurate scoping of the warehousing solution addressing the immediate needs of the financial institution
- Provides the ability to generate star schema and OLAP structures for the rapid prototyping of business reports

The FMDW Scopes

Project Scopes are the method by which a business issue is captured during an FMDW development. A Scope defines the business issue in terms of a set of items (possibly from several different constituent models) within a FMDW instance. For issues related to data warehousing using the Design Model, the involved set of models is most likely to include any or all of the FSDM, Analytical Requirements, and the Design Model.

The Scopes are a predefined statement of scope across all the models to solve a specific problem. They provide a development accelerator by selecting only the required items from the FMDW models that need to be implemented for a specific problem. The Scopes can be customized and expanded to address other areas. For example, several Project Scopes could be created in the course of a project, each one capturing data items added in a particular phase of the project. Scopes can also be used to capture the required content of a report, or the total coverage of a source system model as mapped into the central warehouse model.

The delivered FMDW suite of models comes accompanied with certain pre-defined Project Scopes, which capture significant issues likely to be of concern to developers of data warehouses. The aim of these scopes, defined over various models, is to aid in the scoping of exactly which Design Model entities and attributes are relevant to the issue in point. There are 85 pre-defined views delivered with the FMDW including:

Basel II Pillar 1

CCR Current Exposure Method	Internal Model Method
Standardized Method	Counterparty Credit Risk
Short-Term MA In IRB Approach	Expected Loss & Provisions
Effective Maturity	IRB Credit Risk
Exposure at Default	Operational Risk
Loss Given Default	Securitization Framework
Probability of Default	Standardized Risk Weighted Assets
Treatment of Double Default	Standardized Counterparty Risk Weights

Basel II Pillar 2

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	

Basel II Pillar 3

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

International Accounting Standards

IAS 1 Common Practice Reference	IAS 1 Disclosure Reference
IAS 1 Reference for Examples	IAS 2 Definition Reference
IAS 2 Measurement Reference	IAS 7 Common Practice Reference
IAS 7 Disclosure Reference	IAS 7 Standard Reference
IAS 12 Disclosure Reference	IAS 14 Disclosure Reference
IAS 16 Disclosure Reference	IAS 18 Disclosure Reference
IAS 19 Disclosure Reference	IAS 27 Presentation Reference
IAS 32 Definition Reference	IAS 32 Measurement Reference
IAS 32 Presentation Reference	IAS 33 Presentation Reference
IAS 37 Definition Reference	IAS 37 Disclosure Reference

IAS 37 Measurement Reference	IAS 37 Recognition and Derecognition Reference
IAS 38 Common Practice Reference	IAS 38 Disclosure Reference
IAS 40 Disclosure Reference	IAS 41 Disclosure Reference

International Financial Reporting Standard

IFRS 5 Standard Reference	IFRS 7 Disclosure Reference
IFRS 8 Disclosure Reference	

Sarbanes Oxley Act

Consolidated Financial Statements Notes	Consolidated Statement of Cash Flows
Consolidated Statement of Changes in Shareholders' Equity Analysis	Consolidated Balance Sheet Analysis
Consolidated Statement of Income Analysis	Managements Discussion and Analysis

Project Scopes also exist for:

MiFID and Reg NMS Financial Market Instruments	Know Your Customer (KYC) Investment Arrangement Analysis
Structured Finance Analysis	

Benefits of the FMDW Scopes

- The pre-defined Basel II project views enable financial institutions to quickly see the scope of a particular Basel II requirement across reporting requirements and supporting data structures. Scopes in the area of anti-money laundering (AML) – enable financial institutions to identify the scope to address specific AML reporting requirements.
- Scopes for International Accounting Standards show the coverage in the FMDW for the key IAS standards (e.g. IAS 39, ED 7, IFRIC)

Application Solution Templates

The Application Solution Templates (ASTs) integrate external data standards such as Basel II and International Financial Reporting Standards (IFRS) into the Banking Data Warehouse (BDW) model. The ASTs do this by identifying of warehouse data elements which are required for non-reporting requirements. The Analytical Requirements allow the modeling of a particular class of downstream reporting applications in relation to the enterprise warehouse. However, there are many other downstream applications whose existence may also impose requirements on the content and structure of the warehouse, but which are not structured according to the dimensions and measures of the Analytical Requirements model. Such applications include, for example, data mining, credit risk calculators, credit scoring, and balanced scorecard.

In the FMDW suite of models, such non-analytical reporting downstream applications are modeled in the Application Solution Templates (ASTs). As with the Analytical Requirements, the purpose of the ASTs is to capture requirements in a particular domain of interest, and then relate those to the entities, relationships and attributes of the FMDW Model. To this end, the ASTs are constructed in the language of the users of the given application, but are mapped to the relevant items (entities and attributes) of the Design Model that provide the data requirements of the particular AST item. As with usage of the Analytical Requirements, the user scopes out their requirements using the ASTs, which automatically selects the most appropriate data warehouse structures using the Design Model mappings.

The Application Solution Templates

Credit Risk - Internal Ratings Based	Credit Risk - Standardized and Proposed Ruling
Effective Maturity	Enterprise Payments Platform
Expected Loss (EL) And Provisions	Exposure At Default
Financial Markets	IAS Measurement
IFRS Consolidated income Statement By Function	IFRS Consolidated income Statement By Nature
IFRS Consolidated Statement Current Non Current	IFRS Consolidated Statement Of Cash Flows Direct
IFRS Consolidated Statement Of Cash Flows Indirect	IFRS Consolidated Statement Of Changes In Equity By Categories
IFRS Consolidated Statement Of Changes In Equity By Classes	IFRS Consolidated Statement Of Comprehensive Income
Consolidated statement of comprehensive income, net of tax	Consolidated statement of financial position, order of liquidity
Loss Given Default	Market Risk - Incremental Risk Charge
Market Risk - Internal Model	Market Risk - Standardized
Operational Risk	Probability Of Default
SEC US GAAP	Securitization Framework
SEPA Bank-To-Bank Space	SEPA Bank-To-Customer Space
SEPA Customer-To-Bank Space	SEPA Reversal Events
SEPA Status/Reject/Return Events	Credit Risk - Standardized



The Financial Markets Process Models

The Financial Markets Process Models

In any organization of significant size many business processes that have essentially the same purpose (and therefore should be essentially the same process) are carried out in very different ways in various organization units of the enterprise. The different process flows come about through a number of circumstances such as:

- Mergers and acquisitions
- Varying levels of automation across the enterprise
- Varying organizational structures and responsibilities across the enterprise
- New products or channels

This results in significant cost to the financial institution, including:

- Inconsistent customer experience across channels
- Errors in serving the customer base (e.g. differing process for different products)
- Increased information technology costs in supporting the disparate processes
- Increased management costs due to increased complexity in audit and regulatory governance
- Increased staff training costs and reduced staffing flexibility
- Difficulty in introducing best practice in an enterprise-wide fashion
- Inability to guarantee compliance with policies and regulations

Financial institutions have found that by streamlining processes across organizational units, products, customers and even geographies, they have achieved very real savings and improved their cost to income ratio measurably.

The Financial Markets Process Models have been developed to address this, as well as to create logical models that capture business requirements for development initiatives and help manage change. They have been created to serve as a business process architecture, which is a vital tool for:

- Enabling cross enterprise business process simplification and rationalization
- Providing a fast-path to an enterprise-wide business process architecture
- Documenting complete business requirements
- Managing process change

Business process architectures provide the enterprise with a clear understanding of its business in the context of its many processes. Clear, well-structured business process architectures have always been vital for ensuring efficiency and effectiveness of business operations. The introduction of new technologies such as business process automation (workflow management tools), centralized rules engines and active data warehouses has made business process architectures even more important than in the past. Initiatives such as straight through processing, achieving a zero latency enterprise, and business activity monitoring, are severely hampered without the use of effective enterprise-wide business process architectures.

The Financial Markets Process Models play a critical role in the definition of a services based architecture. It is only through analysis of the processes that support the operations of a financial institution that the service candidates that will best support those processes can be identified. Process analysis also provides essential information about the context of those services, capturing requirements governing the applications that call services within the architecture, and the human roles within the organization that interact with those applications.

The Financial Markets Business Process Model

The Business Process Model (BPM) is a set of logical models of the structure of the most important financial markets processes, where the processes are defined, as much as possible, to be independent of product, channel, organization

structure or technology. By maintaining this independence, the BPM displays the fundamental “core” of business activities that are essential for the continued success of the financial institution. The BPM is represented by flow diagrams that graphically describe what is required to be achieved by each process. The BPM comprises a hierarchy of process flows.

- Processes are comprised of Workflows
- Workflows are comprised of activities and activity strings linked by input and output triggers, all of which are derived from the Financial Services Workflow Model (FSWM). All activities and triggers within the BPM have a “parent” in the FSWM. Mappings are maintained between the FSWM and the BPMs, so that like elements can be copied and reused to achieve efficient, standardized logical modeling.

No part of the BPM would be implemented exactly as described within the model. The BPM is designed to reflect the generic, re-usable elements of a business process. To be implemented, the requirements of the specific product, channel, organization structure and technology at hand need to be introduced into the model through customization.

In business process engineering projects, defining a specific workflow would involve:

- Defining the scope of the project by selecting workflows within the BPM and making a working copy of the workflows in scope.
- Customizing the model copy by firstly applying any re-engineering optimizations (incorporating best practice ideas, increasing parallel activities, removing unnecessary activities, etc.)
- Further customizing the models by making product and channel specific activity names explicit
- Validating organizational responsibilities and updating “swim lanes” into the workflow
- Validating technology support and constraints and updating data flows and system interactions

In this way, a generic process flow is made specific to a particular business situation. By starting with the same generic process flow specification wherever a specific process definition for that workflow is required, standardization and re-usability are maximized.

For process simplification projects (achieving common processes across products and/or channels, harmonization of processes from merged organizations) the steps outlined above would be preceded by identifying strategies whereby the differing process flows are selected according to how well they can be brought into synchronization. Understanding the objectives to be achieved by an initiative is essential as a pre-requisite to scoping workflows and prioritizing workflow customization.

How the BPM is used

Agreeing on the scope of an initiative or application

Having a comprehensive set of business processes to select from enables the scoping of a new initiative to be carried out rapidly and comprehensively. Mapping between the BPM and application specific process models previously created from the BPM enables the potential impact of the new project to be readily and accurately analyzed. Sizing the effort of a project can be made more accurate by knowing how many workflows are involved, allocating time appropriately to each workflow and prioritizing the order of workflow customization in order to do the most important work first.

Optimizing and re-engineering processes

The BPM provides a generic core of “best practice” financial markets process definitions and diagrams. Thus they provide a fast start for process re-engineering projects by providing an existing structure upon which to map the “as-is” environment, and create the “to-be” solution. The BPM eliminates the need to start with a blank sheet of paper. As they are customer focused, they are particularly useful when used in Customer Relationship Management initiatives.

Rationalizing and simplifying product (and other) processes

Because the BPM is designed to be independent of product, channel, organization structure, etc. they are an ideal “target architecture” for process simplification and rationalization projects.

Analyzing Application Impacts and Gaps

Being generic, the BPM is easily mapped to the functionality of application packages. It is a straightforward exercise to compare the functionality of the package to the financial institutions existing or future process requirements documented by the customized BPM, (in order to identify how well an application supports those requirements). It is also possible to compare the functionality of one application system to another to identify reusable solution alternatives for those process requirements.

Supporting a Services Oriented Architecture

It is only through analysis of the processes that support the operations of a financial institution that the service candidates that will best support those processes can be identified. Process analysis also provides essential information about the context of those services, capturing requirements governing the applications that call services within the architecture, and the human roles within the organization that interact with those applications.

Business Scope

<p>Accounting Management</p>	<p>DEFINITION : The management of activities required to maintain the account books of the Financial Institution.</p> <p>EXAMPLE : Activities supporting this function are, for example, to create and maintain a Charts of Accounts, managing the General Ledger, Management Accounting, and Tax Accounting.</p> <p>PURPOSE : To provide the basis for financial or general accounting, management accounting, tax accounting, and financial reporting for the various interested parties of the financial institution.</p>
<p>Arrangement Account Processing</p>	<p>DEFINITION : The management of activities required to record a transaction, monetary or non-monetary, on an account of an involved party arrangement.</p> <p>EXAMPLE : Activities supporting this function are, for example, to modify or close accounts, post a 'hold notice' to block access to funds in an account or a transaction tally on an account, as well as to post debits and credits to that account, whether automatically or manually. It includes the calculation and raising of interest, the generation of fees and charges, and the calculation of commissions payable to staff and third parties.</p> <p>PURPOSE : To ensure that all activities that affect the Financial Institution and customers are faithfully noted.</p>
<p>Arrangement Administration</p>	<p>DEFINITION : The management of activities that result from the review of an Arrangement. These activities include cancellation or suspension of an Arrangement, changes to conditions after commencement of the Arrangement, and renewal of an Arrangement.</p> <p>EXAMPLE : Activities supporting this function are, for example, to maintain details of all open and closed arrangements and to review the satisfactory conduct of the arrangements. Also to change interest rates on a variable-rate loan arrangement or a money-market deposit arrangement.</p> <p>PURPOSE : To ensure the effective update of Arrangements to reflect any changes in circumstances. To ensure a continuing association between the Financial Institution and its customers.</p>
<p>Arrangement Negotiation</p>	<p>DEFINITION : The management of activities required to develop the terms and conditions of an offer, and in negotiating these with a customer of the Financial Institution in attempting to arrive at an agreed contract.</p> <p>EXAMPLE : Activities supporting this function are, for example, to develop several pricing scenarios for a loan, depending upon the amount of down payment or collateral offered and the rate of interest sought. This includes the managing and tracking of arrangement negotiation from the initial contact to closure of the sale.</p> <p>PURPOSE : To facilitate the fulfilment of an arrangement with a customer.</p>

Arrangement Reporting	<p>DEFINITION : The management of activities required to communicate to a customer, or the interested party, the state of the customer's account or arrangement with the Financial Institution. The arrangement reporting needs to be customized to match any accessibility preferences specified by the customer or interested party. Accessibility implies enabling IT hardware, software and services (includes arrangement reporting) to be used by more people, either directly or in combination with assistive-technology products.</p> <p>EXAMPLE : Activities supporting this function are, for example, to gather the transactions related to an account for the statement period, issue a statement of transactions and balances on the accounts that constitute the arrangement, or to issue an overdraft over-limit notice requesting the customer to reduce the overdrawn balance to be within the terms of the arrangement. Also to report the status of an arrangement without a related business account. This includes the production of targeted customer communications as part of the statement generation process, and the generation of pre-defined letters associated with breaches of arrangement conditions.</p> <p>PURPOSE : To satisfy the customers' need for information on the state of the account.</p>
Arrangement Review	<p>DEFINITION : The management of activities required to carry out a periodic review of existing arrangements with a counterparty.</p> <p>EXAMPLE : Activities supporting this function are, for example, to conduct a review of loan documentation to ensure that new signatories on a business loan have properly delegated authority to renew a loan on behalf of their corporation, in the form of recent Board of Director's minutes or newly executed resolutions. Also to examine loan books to ensure that loans procedures have been adhered to, lending limits have not been exceeded, and arrangement conditions such as compensating balances are being maintained.</p> <p>PURPOSE : To ensure continuous validity and efficacy of the arrangement.</p>
Campaign Management	<p>DEFINITION : The management activities required to plan test, execute and monitor marketing initiatives across service delivery channels to sell the products of the Financial Institution.</p> <p>EXAMPLE : Activities supporting this function are, for example, to derive customer profiles from product features, select a target population for the marketing campaign, test a sample of the population to predict the results, launch a direct marketing campaign and monitor the results. This includes the extraction of customer data for marketing and operational campaigns and enables the integration of this data with the chosen marketing channel such as direct mail or telemarketing. Telemarketing integration includes phone call management, script building, call inventory management, performance monitoring and predictive dialling.</p> <p>PURPOSE : To deploy and control direct mail and phone campaigns to sell products.</p>
Channel Management	<p>DEFINITION : The management of activities required to provide the delivery of products and services through the distribution channels of the Financial Institution to its customers. It includes providing the channel with required resources, managing the processing within the channel, and carrying out channel reconciliation.</p> <p>EXAMPLE : Activities supporting this function are, for example, to manage the delivery of products and services through various channels such as the Internet, telephone banking, kiosks, ATMs as a distribution method for balance enquiries, deposits and withdrawals, transfers and payment products.</p> <p>PURPOSE : To ensure efficient management of the channels.</p>
Collateral Management	<p>DEFINITION : The management of activities required to manage the handling of assets presented to the Financial Institution as collateral.</p> <p>EXAMPLE : Activities supporting this function are, for example, to safeguard insurance policies offered as collateral in the vault, to verify that coupon bonds are authentic, and to clip and present coupons for redemption when due.</p> <p>PURPOSE : To ensure that the collateral offered is valid, adequate, and complete, both initially and over the duration of the credit.</p>

Communication Management	<p>DEFINITION : The management of activities required to handle queries from customers, through any channel or medium.</p> <p>EXAMPLE : Activities supporting this function are, for example, to establish standardised query handling with routine procedures, or to train special staff to handle information provision to customers. To manage customer initiated contacts (e.g.: complaints, claims) with the bank to ensure resolution of customer's needs and access to status of contacts at the customer contact points. This includes logging, tracking and controlling customer's enquiries and problem resolution from any channel, as well as providing enquiry routing, status and problem escalation if necessary.</p> <p>PURPOSE : To satisfy the customer by responding to his query in a timely, effective manner.</p>
Corporate Action Management	<p>DEFINITION : The management of activities required to administer the receipt of notification about events which effect material changes to a corporation's capital structure and thus impact its shareholders (including the Financial Institution's investment portfolio shares or the shares held by the Financial Institution belonging to customers). Events can be straightforward or complex, mandatory or optional, such as rights offerings, elective dividends, tender offers, bankruptcies, conversions, mergers, acquisitions, redemptions, spin-offs, periodic dividend or interest payments</p> <p>EXAMPLE : Activities supporting this function are, for example, to make a decision (election) based upon certain financial terms before the event expiration date; to make adjustments for over-subscription and follow-up instructions; to carry out reconciliation, settlement, benefit receipt, and customer allocation.</p> <p>PURPOSE : To exercise prudence in handling the financial impact of material changes to the capital structure or financial position of an issuer of a security or debt instrument which is held by the Financial Institution or its customers.</p>
Financial Market Offering Management	<p>DEFINITION : The management of activities required to support the administration and enactment of financial market offering arrangements and transactions.</p> <p>EXAMPLE : Activities supporting this function are, for example, to enact, reconcile and settle financial market offering transactions. This includes logging, tracking and problem resolution from any channel, as well as providing problem escalation if necessary.</p> <p>PURPOSE : To support financial market offering arrangements by managing transactions relating to those arrangements</p>
Financial Resource Management	<p>DEFINITION : The management of activities required to monitor, project and acquire short and long-term funding for the financial institution and to allocate the capital to the various strategic units of the institution. It refers to the provision of capital for the business and the management of risk for the financial institution.</p> <p>EXAMPLE : Activities supporting this function are, for example, to leverage the expenditure of capital on the purchase of new computer software against the increased income earning capability to be provided by that software.</p> <p>PURPOSE : To provide an income to the Financial Institution and its counterparties within the risk policies and liquidity policy guidelines.</p>
Financial Transaction Processing	<p>DEFINITION : The management of activities required to execute or process financial transactions.</p> <p>EXAMPLE : Activities supporting this function are, for example, cheque processing, automated clearing house payments, electronic funds transfer, asset servicing, letter of credit collections, capital markets brokerage and processing, and payment instrument issuance. This includes the management of failed financial transactions for reporting, correct and resubmission.</p> <p>PURPOSE : To record funds movements.</p>
Human Resource Management	<p>DEFINITION : The management of activities required to recruit, train, develop and deploy the employees of the Financial Institution. This function does not cater for an employee as a customer, which is catered for under Business Operations. This function also covers the handling of temporary, part-time and consulting personnel.</p> <p>EXAMPLE : Activities supporting this function are, for example, to administer hiring, firing, pay and rations.</p> <p>PURPOSE : To assess human resource requirements of the institution, to acquire, train and deploy staff, administer benefits, including wages and salary, and to motivate employees.</p>

Infrastructure Resource Management	<p>DEFINITION : The management of the activities required to administer the tangible, physical resources which support the business of the Financial Institution.</p> <p>EXAMPLE : Activities supporting this function are, for example, to manage the number and efficient usage of photocopying and facsimile machines, telephones, voice recording machines and security cameras. To minimise the cost but adequately support the business with strategic placement and sharing of equipment.</p> <p>PURPOSE : To ensure that the business of the Financial Institution is adequately supported.</p>
Involved Party Information Management	<p>DEFINITION : The management of activities required to capture and maintain information held about involved parties and all the capacities in which an involved party has a relationship with the Financial Institution</p> <p>EXAMPLE : Activities supporting this function are, for example, to maintain involved party information held in a central master repository to which requests for information are routed, and from which definitive information is provided to slave information systems. To update information when an involved party adds new relationships such as single or joint depositor, borrower, guarantor, hypothecator, company director, grantor of a trust, stockholder, agent, supplier, etc. This includes updating current information on customers in any life cycle status (i.e.: existing, prospective, or former) and enables duplicated customer records for the same customer to be identified and the information merged into one record. This also includes providing a snapshot or summarised view of a customer's data including relationships and products held, that is tailored for the role of the person at the customer point of contact, and providing a cross index of where customer information is stored.</p> <p>PURPOSE : To ensure accuracy of information held about involved parties, especially customer information to facilitate cross-selling without duplication.</p>
Market Research Management	<p>DEFINITION : The management of activities that systematically design, collect, register, analyse and report information and findings relevant to specific marketing situations facing the Financial Institution. It involves understanding the market for financial products and services, including competitive, consumer, product and sales research.</p> <p>EXAMPLE : Activities supporting this function are, for example, to ascertain the extent to which a new product proposal will fill an identified gap in the products offered by other Financial Institutions operating in the same market.</p> <p>PURPOSE : To understand the market in general, to develop marketing strategies and plans, to analyse competitor strategies, to assess performance of products, to determine trading relationship segmentation, to evaluate market promotion effectiveness, to measure current standards of service, in order to operate an effective marketing function for the financial institution.</p>
Physical Security Provision	<p>DEFINITION : The management of activities required to supply services to ensure the protection of the buildings, chattels, intellectual property and persons of the Financial Institution, its staff and, where there is a charge responsibility, its customers.</p> <p>EXAMPLE : Activities supporting this function are, for example, to employ security guards to patrol branch lobby areas, or to extend Customer PIN number identification to cash withdrawals from Tellers. This includes providing security to branches and office buildings.</p> <p>PURPOSE : To ensure that all areas of the Financial Institution are protected at a level appropriate to the associated risk.</p>
Product Management	<p>DEFINITION : The management of activities required to develop, promote and distribute the products of the Financial Institution.</p> <p>EXAMPLE : Activities supporting this function are, for example, to generate and develop ideas for new products, to prepare a new product, promotional materials and channels for launch, to stimulate interest among the sales force with a sales incentive programme, to initiate product improvements to meet changing market needs.</p> <p>PURPOSE : To facilitate the participation of the Financial Institution in the financial marketplace.</p>
Product Monitoring	<p>DEFINITION : The management of activities required to monitor products and product groups to determine whether any modification needs to be made to optimise saleability or profitability.</p> <p>EXAMPLE : Activities supporting this function are, for example, to track market penetration and profitability of products and identify product life cycles reaching saturation, to prevent product decline by making modifications to product features or packaging, after its sales peak. Also to review the impact on products of market changes and to review exposure at a product level.</p> <p>PURPOSE : To extend the shelf life and increase the profitability of existing products.</p>

Profitability Determination	<p>DEFINITION : The management of activities required to measure the overall Financial Institution profitability data.</p> <p>EXAMPLE : Activities supporting this function are, for example, to compare income versus expense and produce a profit and loss statement for each business unit or profit centre. Also to perform interest rate sensitivity analysis and account for net interest margin variances at a product portfolio level.</p> <p>PURPOSE : To support the management of assets and deposits and of income and expense growth.</p>
Relationship Management	<p>DEFINITION : The management of activities required to maintain business relationships. It refers to customer-specific activities. This includes customer evaluation, query handling, personal selling, and special customer handling.</p> <p>EXAMPLE : Activities supporting this function are, for example, to assign a customer service representative to a group of customers to establish professional relationships and tailor special customer handling, such as in private banking or investment management services.</p> <p>PURPOSE : To ensure that customers or potential customers obtain the necessary attention.</p>
Resource Item Management	<p>DEFINITION : The management of activities necessary to manage the various resources required to support the business operations of the Financial Institution such as documents and access items.</p> <p>EXAMPLE : Activities supporting this function are issuing and activating resource items, as well as specific behavior relating to access items such as financial transaction cards or checkbooks.</p> <p>PURPOSE : To ensure effective resource support to operate the financial institution.</p>
Risk Management	<p>DEFINITION : The management of activities required to monitor and control risk according to Corporate Risk Policy, including credit risk, market risk, and operational risk management and specific risk management.</p> <p>EXAMPLE : Activities supporting this function include the analysis and management of overall risk exposures (e.g.: counterparty, interest rate, liquidity, sovereign and foreign exchange risk.)</p> <p>PURPOSE : To protect the Financial Institution from financial losses accruing from risk exposure.</p>
Settlement Transaction Processing	<p>DEFINITION : The management of activities required to execute or process the settlement of financial transactions.</p> <p>EXAMPLE : Activities supporting this function are, for example, to provide the automatic posting of bank funds movements, intra-day balances, inter-branch settlements, the calculation of settlement amounts due to counterparties, etc.</p> <p>PURPOSE : To account for financial positions of the Financial Institution.</p>
Supply Chain Management	<p>DEFINITION : The management of activities required to evaluate, select, monitor and maintain records of suppliers of infrastructural resources to the Financial Institution.</p> <p>EXAMPLE : Activities supporting this function are, for example, to check the credit of suppliers to ensure a stable source of supply. Also to give the preferred supplier access to supply inventory levels for automatic resupply through Electronic Data Interchange (EDI).</p> <p>PURPOSE : To ensure that reliable suppliers are used.</p>

Benefits of the BPM

- Brings competitive advantage by being able to process transactions more quickly and at less cost than its competitors
- Reduces time to market for new product introduction
- Assists in the improvement of customer service, encouraging retention and relationship development
- Provide a ready made set of business process definitions with a customer focus
- Include extensive re-use of activities and workflows which reduce system support and staff training requirements
- Promotes a common process language and understanding across disparate lines of business and organization units
- Eliminate redundancy in process variations
- Accelerate solution development, therefore reducing development cost
- Provide a framework into which new products and processes can be easily added
- Risk identification and management controls

The Financial Services Function Model

The purpose of the Financial Services Function Model (FSFM) is to provide a hierarchical list of business functions or areas of responsibility that must be managed by a financial institution. Functions in this list are “normalized”. This means that each function does not include any aspects of other functions in the list. The list is also designed to be complete. This means that the list covers all functions carried out by the financial institution, regardless of who owns those functions or where they are performed.

The list is created by systematically breaking down broad, high level functions into finer and finer detail. The breakdown finishes when, if an existing function is broken down into finer detail, the lower level functions would not be “normalized”, in other words they overlap in their business coverage and begin to describe non-unique activities that tell how a function is performed instead of what responsibilities must be managed.

Thus, the FSFM appears as a hierarchy of functions, where, the “leaves” of the hierarchy comprise the complete, non-overlapping list of functions required for the financial institution to operate. The FSFM defines the terms that can be used, in a consistent, enterprise-wide manner to identify functions carried out by the financial institution.

How the FSFM is used

The FSFM allows rapid and complete scoping and comparison of the functional aspects of business issues.

By identifying which functions are involved in a particular issue, it is possible to quickly create a complete list of the business areas of responsibility that need to be considered in the issue. If other related issues are similarly scoped for another issue by selecting relevant functions from the function model, it is possible to compare and contrast the two issues using a common language and avoid duplication of effort in overlapping initiatives.

For example, an issue may be a proposed new application system. Mapping the proposed new system against the function model helps us gain a clear and complete functional profile of the proposed application. If we have already mapped key organization units against the function model (in other words defining what functions are carried out by which organization units), then it is possible to compare the new application scope with the organization unit scope, giving us a clear picture of the impact of the new application on the various organization units.

Similarly, if existing applications are mapped against the function model, then the functional overlap between these applications and the proposed one can be readily displayed and evaluated.

The FSFM is a vital tool in understanding the scope and impact of any new (or existing) business issue or initiative. Mergers and acquisition integration, organizational restructuring, new product and channel design, enterprise architecture design and application systems definition are but a few of the areas that gain great benefit from the FSFM.

The FSFM is a valuable business and IT planning tool and should be used at the commencement of any new initiative.

Specific uses include:

- Understanding the responsibilities of business units and the dependencies among them
- Integrating similar functions across business areas, supporting reusability of solutions
- Aligning business processes and organizational structure to strategy and prioritizing business requirements in functional terms
- Defining project scope clearly and avoiding duplication of effort with other projects
- Laying the foundation for the design of business workflows and application services/components

Benefits of the FSFM

- Provides enterprise-wide definitions of business function, independent of organization structure or line of business
- Forms part of a common language between business and IT
- Provides a rapid and accurate scoping tool for new initiatives
- Provides a predefined, readily customizable description of financial markets functions

The Financial Services Workflow Model

The purpose of the Financial Services Workflow Model (FSWM) is to provide a consistent, enterprise-wide lexicon for identifying and naming activities and triggers in a manner that is, as much as possible, independent of product, channel, organization structure or technology.

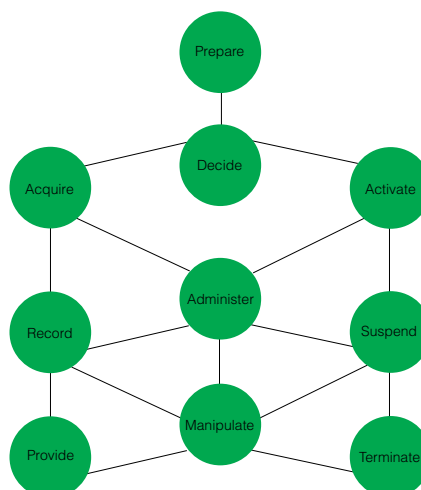
When stripped down to its simplest form, a business process or workflow comprises a series or network of activities, each of which are activated as a result of one or more events or triggers occurring within its environment. Each activity within the workflow can, itself, be the source of events or triggers.

When developing process architectures, the temptation is to immediately start defining the structure of key workflows, that is, defining the interdependencies and sequences of flow within the workflow. However, it is extremely useful to have a set of predefined building blocks that identify the elements necessary to construct workflows. The FSWM is concerned with identifying the elements of workflows rather than defining their structure. It adds value in managing the basic workflow elements in a standard way to identify reusability.

The FSWM defines the terms that can be used in a consistent, enterprise-wide manner to identify activities and triggers that form the basis of processes of interest to the financial institutions.

FSWM Verbs

In order to ensure that activities are identified and named in a consistent manner across the enterprise, it is necessary to have an agreed vocabulary. Naming an activity involves a verb and a noun. An activity does something to something, e.g., “Accept Customer”. The rich set of FSDM nouns requires a set of standardized verbs for use in the modeling process. The FSWM provides this verb set, classified by ten key, generic verbs. These are then expanded into over 100 specialized verbs. The generic verbs are:



FSWM Triggers

When the wide range of business triggers (also understood as stimuli or events) of interest to a financial institution are carefully analyzed, it is apparent that they each fall under one of six major classifications:

- Communication driven triggers - relating to communications received or sent by the enterprise
- Condition driven triggers - relating to changes in conditions or parameters
- Decision driven triggers - relating to decisions made by the enterprise
- Incident driven triggers - relating to expected or unexpected incidents noted by the enterprise
- Opportunity driven triggers - relating to business opportunities arising
- Time related triggers - relating to time passing or instants in time

These trigger classifications are expanded into many hundred sub-classifications of trigger types

FSWM Activities

The combination of the FSDM nouns and preferred verbs provides a comprehensive lexicon for naming activities in a consistent manner. Experience with this lexicon suggested that a 'starter set' of frequently occurring activities, with their definitions, is of significant value. Thus, IBM in conjunction with a number of major financial institutions set about developing such a generic activity set. While doing so, it was noted that certain types of activity appeared many times, associated with different business concepts (nouns). For instance, activities associated with 'details', 'quantities' or 'authorizations'. Rather than repeating these activities for each concept, they were grouped under an overall heading of 'Expandable Object Activities'. Thus, the Activity Set comprises two headings, 'Generic Object Activities' and 'Expandable Object Activities'. The Generic Activities are extended into a set of over 700 activity names and definitions while the Expandable Activities are extended to over 150 Generic Activities. When the Expandable Activities are fully expanded within the Generic Activities, then the FSWM identifies over 3000 standard Activities.

How the FSWM is used

Developing an Enterprise Process Model

Together, the FSWM and BPM (see next page) comprise the major components of a financial institutions enterprise-wide process definitions. While they are constructed to reflect the most important processes that are required by all financial institutions, the models are designed to be rapidly customized to the precise requirements of a particular financial institution. They assist a financial institution aiming to develop an enterprise process model in a fraction of the time that would be required if it were to be built from scratch.

Agreeing on a common lexicon

Having a predefined set of activity and trigger names and definitions means that business analysts on different projects can use the same standard wording in modeling workflows and benefit from recognizing and reusing work from similar projects, thus speeding up the development process.

Generating Specific Process Activities within an enterprise-wide context

The activities and triggers within the FSWM are designed to be independent of product, channel. When the financial institution is designing a process for a specific product, channel, organizational structure etc., appropriate FSWM activities and triggers are copied to the new process design then modified to reflect the specific requirements (specific product, channel etc.) of the process at hand. A mapping is then maintained between the FSWM roots and the activities and triggers in the new processes.

Managing Enterprise-wide Processes

Mappings from the FSWM to specific activities within the financial institution's processes provide a consistent, enterprise-wide index to processes. This reveals where similar processes are found in different parts of the enterprise. This then encourages re-use, avoids redundancy and promotes business agility.

The Financial Markets Service Models

Benefits of the FSWM

- Fast path to an enterprise process model, often required by regulators
- Consistent identification and naming of activities across the enterprise
- Minimized redundancy of analysis and implementation
- Greater consistency in process design
- Business requirements identified more accurately and faster., and for lower cost



Integration issues are a major concern for financial institutions. Existing infrastructure must be retained, yet in order to meet the demands of today's business issues, a consistent architecture is required that maximizes reuse and supports the development of new initiatives.

Services oriented architectures (SOA), as a basis for integration and as a means of structuring large-scale software architectures, are rapidly becoming the backbone of the modern financial institution. An SOA can increase the speed of business changes, improve business efficiency and performance, and protect the privacy and security of critical information assets. It enables IT to align more tightly with business strategies in a cost effective manner and in a secure and managed integration environment.

A key factor underpinning successful SOA is a common enterprise-wide description of the business concepts and processes that are of interest to a financial institution. Without this common language any attempt to support a consistent and flexible architecture will more than likely fail.

The Financial Markets Integration Models provide this common language. The models support a complete and unambiguous description of the business services required to support the financial institution. The FM Integration Models enable the efficient and accurate gathering of requirement and guarantees the consistency of definitions with a single integration effort or across multiple projects.

The FM Integration Models are tightly coupled with the FM Process Models, describing the underlying services that support these processes at runtime. Using the FM Integration Models, business concepts can be traced from analysis level through design level refinements to actual component and message definitions that provide a quick start for the specification of a common services bus within the organization.

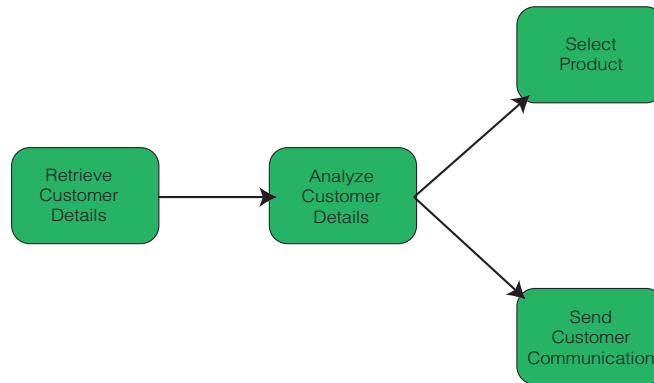
The Financial Markets Business Object Model

The Financial Services Business Object Model (FS-BOM) provides business content and guidance for analysts and designers working in the context of creating a services oriented architecture and is used to clearly capture business requirements at a sufficiently detailed level. The FS-BOM is also designed so that these requirements are expressed in a manner that is valuable for systems development.

The analysis of the reusable elements that appear within business processes defined by the FM Business Process Model will allow the identification of candidate business services that support those processes. For example, the business process for Account Opening will require the retrieval of "customer details". Other business processes, elsewhere in the financial institution, will have the same requirement. It is possible to identify a single solution that satisfies both these requirements and can be re-used across the financial institution. This solution is a business service.

The FS-BOM allows reusable elements within business processes to be explored further with the aim of identify actual business services. The FS-BOM is structured as:

- A set of use cases, which describe service candidates
- A model of business concepts, which are used by these use cases

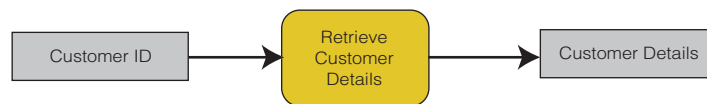


An example business process

Use Cases

Reusable elements within business processes are analyzed further within the FS-BOM as use cases, which will aid the completion of requirements definition. These use cases are presented in two distinct ways:

- A high level representation of the use case and the inputs and outputs of that use case as a whole.
- A decomposition of these high-level use cases into sequences of business activities, the interactions between these activities and key business concepts within the model.

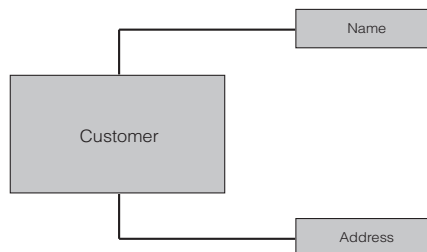


An example use case

The Business Process Models provide the context in which a requirement occurs while the use cases in FS-BOM describe the actual requirements.

Business Concepts

Part of describing a requirement in a use case is describing the business concepts, or classes, involved in that requirement. For example in the case of retrieving “customer details” it is important to be able to describe the customer details themselves and how they relate to other concepts in the model. The FS-BOM contains detailed UML models describing these classes.



An example class

For example, the class “Customer” defines the characteristics, responsibilities, and constraints that apply to every customer. Each class is composed of:

- **Attributes:** which describe a piece of information about the class. For example, the attribute `dateOfBirth` defined as part of `Customer` provides details on the customer date of birth. Using attributes, the business modeler can capture specific characteristics of any business concept.

- **Operations:** which describe an action that can be performed on a class. For example, the operation getName, defined as part of Customer, will retrieve the name of that customer, or perhaps a specific type of name depending on the requirements.
- **Associations:** which describe a relationship between two classes. For example, a Customer having an Address. Often these associations will support the operations of the model e.g. getCustomerAddress.

These classes modeled within the FS-BOM are grouped into packages, which represent specific business areas, supporting a wide scope of over 360 business level use cases. Packages allow:

- Clear separation of business concepts/classes
- Enhanced model readability
- Easier manipulation of the model, as each package can be controlled independently

The use cases and business concept (class) definitions work together to fully describe the business requirements and rules of a financial institution with the aim of providing the information necessary to modelers designing a services oriented architecture.

Examples of Business Concepts

Accounting Management	Arrangement Account Processing
Arrangement Account Administration	Arrangement Negotiation
Arrangement Reporting	Arrangement Review
Business Operations Management	Campaign Management
Channel Management	Collateral Management
Communication Management	Financial Market Offering Management
Financial Resource Management	Financial Transaction Processing
Human Resource Management	Infrastructure Resource Management
Involved Party Evaluation	Involved Party Information Maintenance
Market Research Management	Physical Security Provision
Product Management	Profitability Determination
Profit & Loss Management	Relationship Management
Resource Item Management	Risk Management
Settlement Transaction Processing	Supply Chain Management

Uses of the FS-BOM

- Capture more detailed requirements of particular business activities
- Enforce consistency in captured requirements
- Identify where there are candidate services for a services oriented architecture
- Provide a point at which all business requirements should be definitively captured

Benefits of the FS-BOM

- Express requirements in a very structured way.
- Designed to be understood by both business and IT and acts as a communication bridge between the communities.
- Provides an environment in which reuse possibilities can be identified and verified
- Provides a firm basis on which integration or services oriented architecture solutions can be built
- Enables consistency of definitions
- Provides a ready built model so you can focus on business issues rather than building a model from scratch

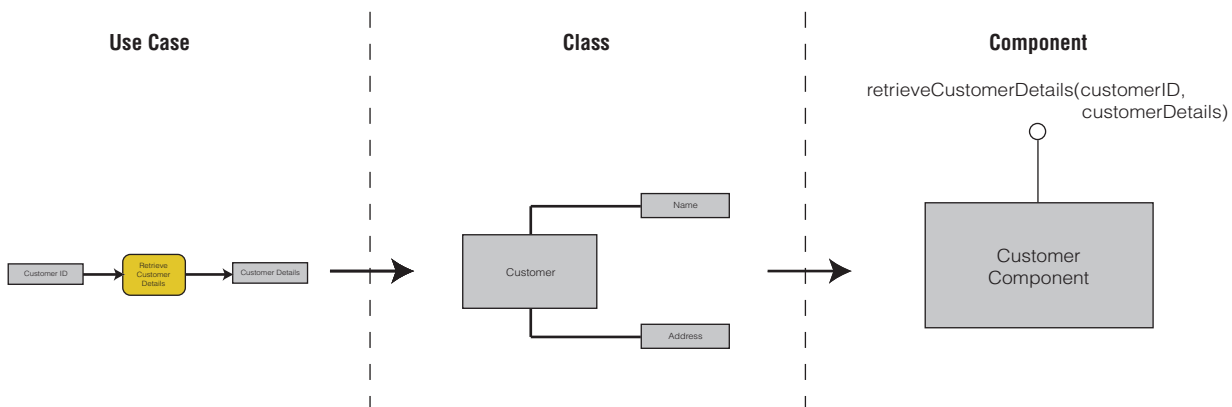
The Financial Markets Interface Design Model

The Financial Services Interface Design Model (FS-IDM) takes the analysis level use cases and concepts identified within FS-BOM, and allows the financial institution to specify a services oriented architecture that meets these requirements. This task is normally performed by a technical team within the financial institution who make design level decisions based on concerns such as the technology environment. This team is working from a stable model of business requirements (FS-BOM) which eliminates the need for repeated specification of requirements. This greatly increases the applicability of technical solutions and reduces the time taken to specify them. The FS-IDM was developed to:

- Assist modelers in designing reusable services that meet the financial institutions stated requirements,
- Define business components that support these services
- Define standard interface definitions that describe the communication between software systems in the financial institution

Business Service Groupings

The FS-IDM is structured as a component model, describing units of software which satisfy specific business requirements. The actual requirements which are supported by a component are described as interfaces, which group related services. The internals of a component within FS-IDM are derived from the class models of the FS-BOM, providing the detailed class definitions and relationships which describes how the component operates. The interfaces of these components are derived from the use cases of the FS-BOM, describing the capabilities of these components and how they interact.



Examples of Business Components

Arrangement Account Administration	Arrangement Management
Arrangement Negotiation	Arrangement Reporting
Asset Management	Capital Management
Channel Management	Collateral Management
Communication Management	Financial Market Offering Management
Financial Transaction Card Access	Financial Transaction Processing
Human Resource Management	Infrastructure Management
Involved Party Evaluation	Involved Party Management
Liability Management	Liquidity Management
Market Management	Product Development
Product Distribution	Profit & Loss Management
Relationship Monitoring	Risk Management
Special Customer Assistance	



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