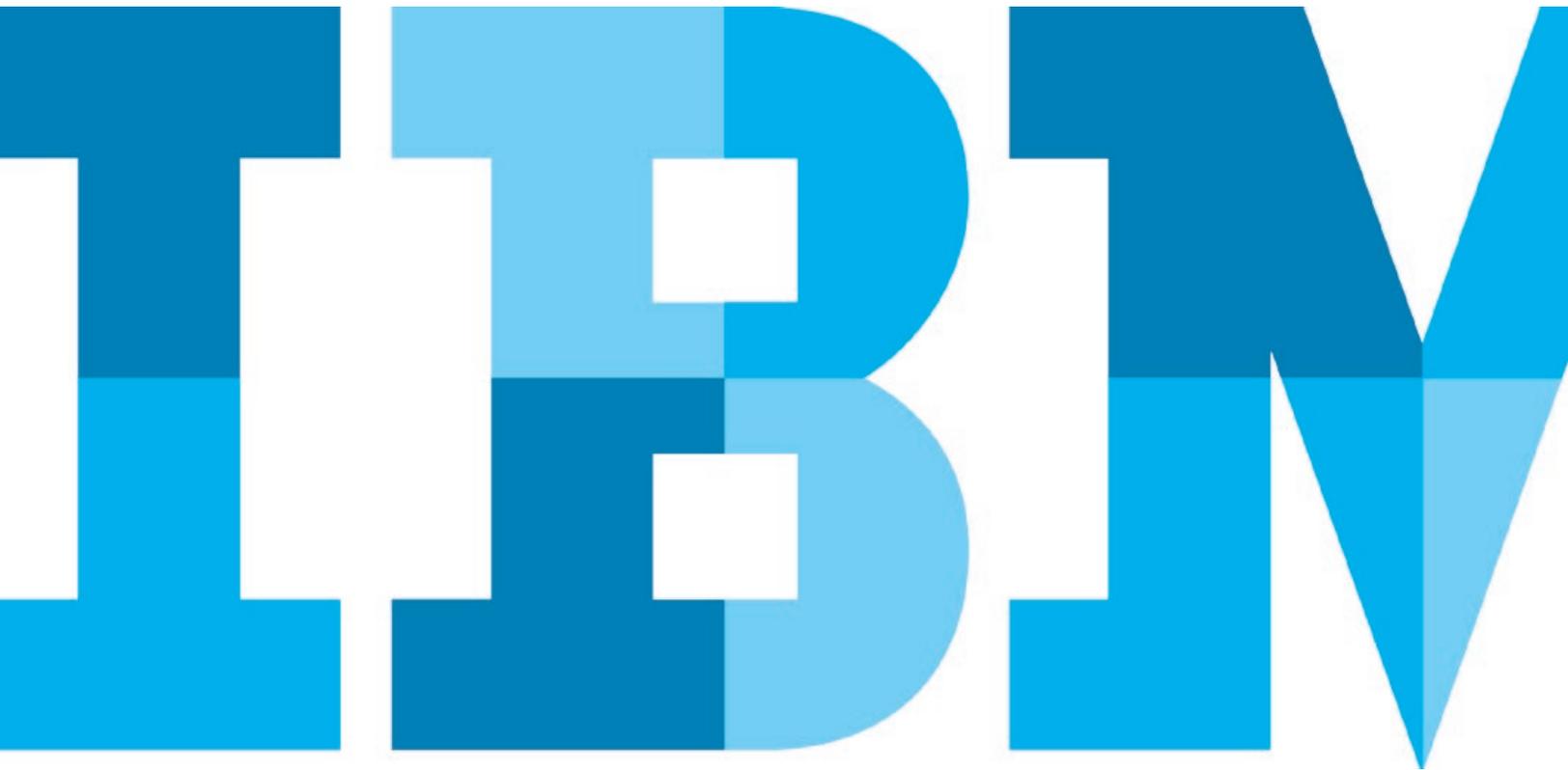


IBM Analytics

# IBM Banking Process and Service Models

## General Information Manual



# Executive Summary

## Business Challenges

The pace of change in the financial services industry has accelerated markedly in recent years. Mergers and acquisitions, the introduction of channel architecture, the development of diverse channel technologies, the introduction of insurance products into the branch network and the shift in focus from transactional systems to customer-facing systems such as operational single view of customer have all brought about extensive changes in the way financial services organizations operate. By necessity, standalone solutions have been developed, supported by an array of individual processes and procedures that often mimic and duplicate each other, but are sufficiently disparate to cause cost and training issues for financial services organizations, impairing the synergies and savings available to a coherent, strategic organization.

Adding new regulatory components such as the CCPA, GDPR<sup>1</sup>, Basel II/III Accord, Anti-money Laundering (AML), Know Your Customer (KYC), Single Euro Payments Area (SEPA), and Foreign Account Tax Compliance Act (FATCA) to this scenario compounds the change management issues, and makes it harder to accomplish business objectives within a reasonable time frame and at a reasonable cost. In addition, the information technology paradigm is ever present, pressing the organization into technology solutions often misaligned with overall objectives. They can be hastily put together without sufficient input from the business, frequently disappointing in terms of value and functionality.

Is there a better way to achieve synergy among merged entities, deliver genuinely customer-serving processes, contain costs and employ technology in an effective and business-serving manner? Clearly these are not easy objectives to achieve, but financial services organizations that have done so successfully have enjoyed significant growth in market share, increased profitability and higher return on investment (ROI) for shareholders.

## Successful Business Transformation

The secret to success is the adoption of a top-down strategic approach to the transformation of the business not constrained by specific technology, particular products or channels or organizational structure. Such a transformation would be a daunting task if undertaken against a blank canvas, and in reality would probably not succeed by virtue of the management input needed and the overall elapsed time to achieve results.

IBM® Banking Process and Service Models (BPS) are a content-rich set of models designed specifically for financial services organizations. Enhanced and extended to align with the requirements for risk and compliance and optimally allow for the development of more efficient straight through processing solutions. By using the models, the approach to transformation could be shortened, with consequent savings in time and money for the organization, the models represent leading practice and have been validated through use with many of the world's leading financial services organizations over several years.

By adopting BPS you could:

- Increase customer satisfaction, grow the customer base and reduce the cost of selling and servicing customers
- Identify opportunities to streamline processes, making service delivery cheaper and quicker
- Identify processes that essentially do the same thing and therefore should be amenable to rationalization. This reduces training and maintenance overheads, improves your cost-income ratio and provides better and less costly service to your customers
- Be better able to ensure completeness in terms of regulatory compliance and risk management, potentially releasing capital to provide additional lending and investment capacity
- Reduce time to market for new products and services by exploiting existing processes and avoiding process redundancy
- Align your business process management efforts to strategic objectives to ensure that you are doing the right things for the right reasons
- Specify requirements clearly to technologists so that high-quality solutions can be developed

### Business Transformation

Financial services organizations need to re engineer existing business processes on a continuing basis to meet objectives such as:

- Streamlining and standardizing processes following merger or acquisition
- Improving customer service for competitive advantage
- Reducing operational costs
- Meeting the requirements of regulators
- Adapting to new trends in the market
- Exploiting new products, channels and technology that become available

Re-engineering processes and services can be particularly challenging when undertaken in the absence of a reference model. Without a model as reference, much time is often spent on capturing the “as is” position, and it is often difficult to get agreement on ordinary processes and definitions such as Product, Account or even Customer.

These issues become exacerbated when the re-engineering effort is spread over different geographies.

**Business Transformation:** For post merger/acquisition integration, process centralization and process outsourcing.

**Regulatory Alignment:** CCPA, GDPR<sup>1</sup>, PSD2, Basel II/III Accord, and FATCA.

**Standards Alignment:** ISO 20022 payments and Securities messages, or the BIAN Service Landscape

**Process Automation:** For example, the creation of efficient straight-through processing (STP) payments or account opening processes amenable to automation.

BPS facilitates process re-engineering by:

- Providing tried and tested standard definitions that are easily understood by business people and IT personnel
- Allowing the initiative to focus on the “to be” processes, saving time and effort
- Ensuring coverage based on years of accumulated in-depth knowledge of how best-in-class financial organizations operate

### Regulatory Alignment

By using process and service models, you will be able to demonstrate that your processes and services not only help to manage risk wherever it may occur in financial services organizations, but you will also be able to demonstrate that you have modified and extended your processes and services for this purpose. This can be a significant factor in protecting your risk rating or even improving it. In practice, the IBM model driven approach enables financial services organizations to define their target business processes and services for re engineering and transformation in the areas of risk and compliance.

BPS, with a rich set of industry application processes and services, can be used as a key accelerator for a logical design in building new risk and compliance functionality.

Financial regulators lay challenges at the door of all financial organizations trading internationally. Processes and services need to be modified to create division of duty and identify where operational, market or credit risks may arise in financial services organizations together with steps to manage such risks. Furthermore, it is necessary to demonstrate that these processes and services are in place and working in order to protect financial services organizations’ risk rating with rating agencies and analysts. BPS includes processes and services that help to align your financial services organization with these challenges.

### Data Privacy and Protection – GDPR

BPS includes support for the General Data Protection Regulation<sup>1</sup> (GDPR) and can help organizations ensure their enterprise process and services architecture has design artefacts available to capture, process and report on data protection issues. It provides a design solution for the process terminology and services design requirements to support the GDPR. It isolates and represents the distinct data terms from the GDPR in an easily navigable structure which clearly relates each term to the enterprise terminology, translating the regulatory context into how it would be more commonly known across the organization.

### Data Privacy and Protection – CCPA

BPS also supports the California Consumer Privacy Act (CCPA) and provides an industry specific vocabulary, that can help insurers understand requirements for consumer data privacy. Building on the foundations put in place with GDPR, CCPA identifies the key terms within the regulation which are mapped to the business terms. The coverage can help understand what components to review considering consumer rights, personal data types, processing activities, processing purposes, and roles. BPS also provides a solution for process and services design requirements to support the CCPA.

### Inefficient IT infrastructure and Resistant corporate culture

The motivations of SEPA are both political and economic. The single currency has greatly enhanced the need to standardize the area of payments and reduce the complexity and costs across domestic and cross-border payments. SEPA addresses the needs of both electronic payments products and those of paper-based products, and eliminates national barriers, foster greater competition and help to drive down revenues and costs.

BPS supports financial institutions in achieving their strategic payment objectives by adopting and leveraging best practices

and open standards advocated by IBM's vision of SOA. The purpose of MiFID is to:

- Protect investors
- Provide harmonization in the market across the member states
- Make liquidity in the marketplace more transparent and accessible

The directive impacts the operational, compliance and supporting functions within a firm. It will lead to a EUR 1 billion technology spend by capital markets participants, while creating a EUR 1.15 billion revenue-generating opportunity for the investment industry.

It opens up the marketplace to financial institutions. Once the financial institution is registered in one member state, it will be automatically entitled to trade across all member states.

FATCA targets non-compliance by U.S. taxpayers using foreign accounts. FATCA requires foreign financial institutions (FFIs) to report to the IRS information about financial accounts held by U.S. taxpayers, or by foreign entities in which U.S. taxpayers hold a substantial ownership interest. Failure to comply with this regulation can result in fines, a withholding tax, and expose the financial institution to a damaged reputation.

### Standards Alignment

Business standards produced by organizations such as the International Organization for Standards (ISO) and Banking Industry Architecture Network (BIAN) generate an openness and credibility amongst business communities, and they enable organizations to more efficiently and more effectively innovate in a particular area of business. By aligning with specific industry standards, BPS demonstrates that customers can achieve their business objectives of adopting standards through use of the BPS. BPS provides support for banking industry standards such as ISO20022 Payments and

Securities messages, and the BIAN Service Landscape.

The Payment Services Directive 2 (PSD2) is an EU regulation which came into force in Jan 2016 but must be implemented by 2018. With the objective of providing support to an API developer creating a RESTful API for PSD2 support, the content of the BPS Restful API Design Model has been expanded to provide cover for the areas of banking that relates to PSD2. BPS acts as an accelerator towards the implementation of PSD2 and can be extended and customized to keep up to date with changes to requirements.

### Process Automation

The creation of efficient, automated processes can have a significant effect on key business objectives, such as:

- Improving customer service, reducing attrition and enabling cross-selling opportunities
- Reducing costs
- Improving time to market for new products
- Developing new channels

BPS can be of benefit in each of these cases in many financial services organizations around the world. Customer service is improved by quicker reaction times and improved quality of response to queries and complaints, the provision of self-service facilities such as internet and telephone banking and by creating the perception of a segment-of-one service with profitable customers. In terms of cost reduction, BPS helps by showing how to eliminate unnecessary steps in processes and where activities can take place in parallel rather than sequentially, with fewer touch points. Time to market is improved by using the models to identify where existing processes can support new products and new channels. This technique also reduces the number of product-specific and channel-specific, but redundant, processes in use throughout financial services organizations, reducing training and maintenance costs across a wide area.

**Example: Payments Processing**

Faced with increasingly demanding customers and regulatory pressures, financial services organizations are urged to rethink their business strategy and operational plans towards payments. They are challenged to maintain profitability in the face of increased competition. The need to increase operational efficiency and cut costs has never been greater.

These challenges are focusing minds within financial services organizations to achieve seamless, end-to-end, straight-through processing (STP) from customer initiation to interaction with real-time gross settlement systems (RTGs) to final notification of the involved parties, while simultaneously integrating value-added services.

Payment solution costs remain high due to the varied approach financial services organizations take to making, receiving and reconciling payments and the level of manual interventions in end-to-end processing. If financial institutions were to achieve maximum cost effectiveness, process efficiency and facilitate an enterprise-wide risk management approach, it is critical that they move towards more homogeneous and standardized business modeling that enables the elimination of a product-silo-development approach and maximize reuse of processes across product lines.

Financial services organizations need to look at alternatives to processing payments in the traditional paper format and move towards implementing electronic STP solutions that result in cost reductions and can cater for higher volumes. An institution needs to take an integrated approach to payments to reduce cost and complexity. This is a further key to achieving competitive advantage.

In order to achieve the objective of increased automation, BPS helps identify the commonality of processing across the diverse payment systems, thereby understanding those common elements that can be re-engineered into non-interruptible and automated processes from file receipt all

the way to reconciliation and customer communications.

BPS forces financial services organizations to rethink their strategic vision and define payment solutions not in the standard product silo manner, but to define the commonality across products and systems rather in a vertical/silo.

By using BPS, financial services organizations will benefit from a flexible payments framework that allows them to respond rapidly to market shifts, customer demands and regulatory requirements.

**Example: Account Opening Processing**

Similarly, account opening inefficiencies hamper efforts to attract customers and cut costs. Driven by customer expectations and competitive pressures from market leaders, financial services companies are reassessing their delivery and customer management strategies. By eliminating inefficiencies, they are able to reduce costs as well as attract and retain customers. Account opening processes represent a substantial opportunity to improve the productivity of a critical customer-facing process, while driving down costs.

The BPS Account Opening solution:

- Maximizes the speed of account opening
- Minimizes operational costs by replacing paper-based manual processes with electronic forms that simplify data capture and eliminate keying errors
- Maximizes responsiveness to customers and business productivity by leveraging a common content repository
- Manages risk and exposure to fraud by automating application processing and making the right credit offers to the right customers
- Optimizes costs and performance throughout deployment and ongoing operations by modeling and monitoring account opening processes
- Helps deliver real business value with an integrated solution that transforms the account opening process

## BPS Benefits

- Reduced development time
- Ready-made processes and services constructed with customer focus, without the need to reinvent the wheel
- Control flow logic pre-analyzed, saving a lot of time in BPR projects
- Consistent activity naming standards bring common understanding to business and technology people
- Parallel processing opportunities reduce processing times
- Triggers enable you to see what stimulus starts an activity or activity stream and what results are produced when an activity is completed
- Integration and consistency with other IBM models make your projects extensible
- Extensive re-usability of activities and processes translate into less process maintenance and reduced training costs, while enabling flexibility in the workforce
- Customizable generic templates enable you to meet your organization's specific requirements
- Business requirements are defined in a cheaper, faster, easier and more complete manner
- Leading-practice content validated by world leading financial services organizations over many years
- Improved quality of developed components on any technology platform
- Flexible implementation of process with standards and variables applied to multiple implementation
- Package selection is improved to match your needs
- Support for ISO 20022 Payments and Securities messages allows financial institutions to exchange large amounts of information in key business areas in an efficient and effective manner

## IBM Component Business Model

Project scoping can also be carried using the IBM Component Business Model (CBM). CBM is an organizing framework combining people, process and technology perspectives that drives substantial new insights and allows new methods of analysis for the organization. CBM is a logical representation or map of a business that reveals its essential building blocks. A business component can be defined as the collection of business activities it performs and its supporting people and systems requirements.

CBM can be populated with BPS content, thereby transforming CBM from components to solutions. BPS provides detailed banking model content that supports more than 80% of the high-level function components listed in CBM. CBM business components, representing functional business areas, are underpinned by a number of BPS processes.

# Components

## Vocabulary Models

- Business Terms
- Business Functions
- Scopes
- Supportive Content

## Process Analysis & Design Models

- Value Chains
- Analysis Process Model
- Orchestration Process Model

## Service Analysis & Design Models

- Business Object Model
- Interface Design Model
- Transfer Object Model
- Web Service Design Model
- Message Service Design Model
- Java Service Design Model
- RESTful API Design Model

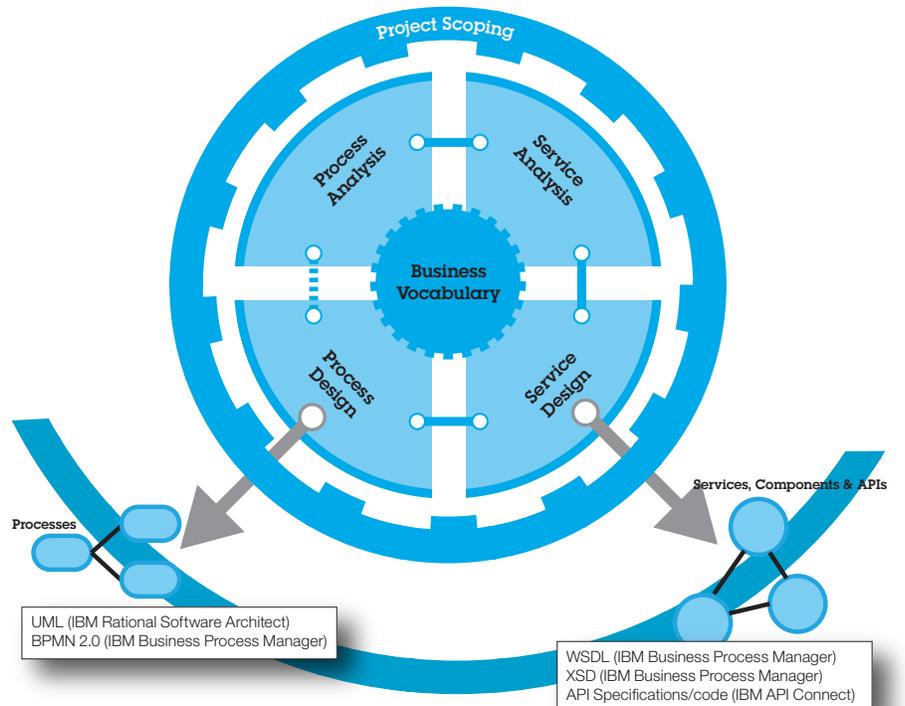


Figure 1. IBM Banking Process and Service Model components

# Vocabulary

## Business Terms

Business terms define industry concepts in plain business language, with no modeling or abstraction involved. Business terms have a set of properties and are organized by business category. Clearly defined business terms help standardization and communication within an organization. Mappings to other data and process models make it possible to create a common, enterprise-wide picture of the data requirements and to transform these requirements into IT data structures.

Business terms define key business information used for business operations and analysis, enabling users to understand information used by IT assets by allowing traceability between business terms and IT assets. As a consequence, developed IT solutions are driven by business requirements.

Business terms should exclude terms that are not meaningful to a business user, such as terms that are too abstract.

Business terms do not model data requirements, but capture the data requirements in a simple and flat structure. The modeling activity happens in the subsequent use of the data models, when the business terms are modeled using modeling artifacts such as inheritance, relationships and attributes.

Business terms are defined by properties that describe in business language, the meaning of the business term and its status, organized by business category within a structured hierarchy.

## Business Functions

The Business Functions category provides groups of business terms describing a Banking Capability Model. All functions provide a hierarchy of standard business functions or areas of responsibility managed by financial services organizations. Functions in this hierarchy are normalized, which means that each function is exclusive and does not include any aspects of other functions. The hierarchy is also designed to be complete, which means that the hierarchy covers all functions carried out by financial services organizations, regardless of function owner or place.

It appears as a hierarchy of functions, where the lowest level of the hierarchy comprises the complete, non-overlapping list of functions required for financial services organizations to operate. The functional hierarchy does not represent an organization chart, but clarifies the functions at the lowest level of the hierarchy and enables navigation to them.

It defines the terms that can be used in a consistent, enterprise-wide manner to identify functions carried out by financial services organizations. It provides a complete list of financial services functions that are independent of organizational structure, location, product line, channel or any other business aspect.

The purpose of other sub-categories under Business Functions, namely all activities, verbs and triggers, is to provide a consistent, enterprise-wide vocabulary for identifying and naming processes, activities and triggers independent of product, channel, organization structure and technology. Stripped down to its simplest form, business processes comprise a series or network of activities, each of which are activated as a result of one or more events or triggers occurring within their environment.

When developing process architectures, the temptation is to define the structure of key processes, the interdependencies and sequences of flow within the process. However, it is extremely useful to have a set of predefined building blocks that identify the elements necessary to construct processes. This component is concerned with identifying the elements of processes rather than defining their structure and adds value in managing the basic process elements in a standard way to identify re-usability.

The Business Functions are an important part of the Industry Model concepts. Leading financial services organizations worldwide have been using these structures together with other Industry Model offerings for the purpose of redesigning their business processes. This component comprises hierarchies of generic activities, trigger types and standard verbs in easily referenced structures.

### Uses for Business Functions - All Functions

**Scope business issues:** Allows rapid and complete scoping and comparison of the functional aspects of business issues and initiatives. By identifying functions involved in a particular issue, it is possible to quickly create a complete list of the business areas of responsibility to be considered in the initiative. If functions are similarly scoped for another issue, it is possible to compare and contrast the two issues using a common language and avoid duplication of effort in overlapping initiatives.

**Determine information systems suitability:** For example, an issue may be a proposed application system. Mapping the new system against the function model helps to 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), it is possible to compare the new application scope with the organization unit scope, giving a clear picture of the impact of the new application on the various organization units.

**Identify gaps:** Similarly, if existing applications are mapped against the function model, the functional overlap between these applications and the proposed application can be readily displayed and evaluated to avoid duplication in application development and facilitate reusable solutions.

### A Powerful Business Tool

The project scoping component 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 benefit from the component. The project scoping component is a valuable business and IT planning tool and should be used at the commencement of any new initiative.

### Uses for Business Functions - Activities, Verbs, and Triggers

#### Agreeing on a common lexicon

Having predefined activities, trigger names and definitions means that business analysts on different projects can use the same standard wording in modeling processes, as well as benefit from recognizing and reusing work from similar projects to speed up the development process.

#### Generating specific process activities within an enterprise-wide context

The activities and triggers within business terms & naming conventions component are designed to be independent of product, channel, technology and organizational structure. When financial services organizations design processes for a specific product, channel, organizational structure or technology, appropriate activities and triggers are copied to the new process design and then modified to reflect the specific requirements of the process at hand, such as specific product and channel, a mapping is maintained between the component roots as well as the activities and triggers in the new processes.

### Managing enterprise-wide processes

Mappings from the component to specific activities within financial services organizations processes provide a consistent, enterprise-wide index to processes. This reveals where similar processes are found in different parts of the enterprise. This encouraging reuse, avoiding redundancy and promoting business agility.

Specific uses include:

- Understanding the responsibilities of business units and the dependencies among them
- Integrating similar functions across business areas, supporting re usability 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 process and application services/components
- Ensuring the completeness of SOA

### Business Functions Components

**Triggers** - Business triggers, also known as stimuli or events, fall under one of six major classifications:

- Communication driven - Communications received or sent by the enterprise
- Condition driven - Changes in conditions or parameters
- Decision driven - Decisions made by the enterprise
- Incident driven - Expected or unexpected incidents noted by the enterprise
- Opportunity driven - Business opportunities arising
- Time related - Time passing or instants in time

This component provides a large set of well-defined trigger types to prompt the analysis of process input and output stimuli when building or customizing business processes.

**Preferred Verbs** - To ensure that processes and activities are identified and named consistently across the enterprise and their level of reuse optimized, it is necessary to have an agreed vocabulary. Naming an activity involves a verb and a noun. An activity does something to something, for example, “Accept Customer”. The rich set of nouns requires a set of standardized verbs for use in the modeling process. This component provides this verb set, classified by ten key, generic verbs expanded into a large number of specialized verbs that cover the complete life cycle of actions needed to be performed on objects. These generic verbs are:

**Activities** - The combination of the nouns and preferred verbs provides a comprehensive lexicon for naming activities in a consistent manner. Experience with this lexicon suggests that a starter set of frequently occurring activities, together with their definitions, is of significant value. In conjunction with a number of major financial services organizations, IBM set about developing such a generic activity set.

While doing so, certain types of activity appeared many times, associated with different business concepts (nouns). For example, activities associated with “details”, “quantities” or “authorizations”. In summary, the Business Terms and Naming Conventions define 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 financial services organizations.

### **Other Important Principles of Construction**

- Business processes may support many functions, while one function may be supported by many business processes
- Business processes should have a designated business owner
- Processes are implemented by teams of people, acting in different roles according to the skills profiles required to perform the constituent activities of each process
- Activities may be manual or automated and performed by individuals, teams, application systems or automated routines, depending on implementation
- Each activity requires data to perform the task and a set of business rules controlling the transformation of data into meaningful information, how the information should be interpreted and the appropriate decisions to be made

### **Benefits**

- 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 services functions
- Helps to identify functional overlap
- Can be used to identify ownership of business issues
- Allows for the identification of processes that support individual functions
- Helps to identify duplicate functions in multiple business units
- 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 the process design
- Business requirements identified are cheaper, better and faster

## Scopes

Project Scopes are the method by which business issues are captured within a process and service modeling project. A project scope defines the business issue in terms of a set of items, possibly from several different constituent models.

The involved models are most likely to include any or all of Business Terms, Business Terms, Business Functions, Analysis Process Model, and Business Object Model. Users can create their own project scopes to support their project requirements. For example, several project scopes can be created in the course of a project, each capturing data, process, and service elements added in a particular phase of the project.

The Vocabulary is delivered with over 300 predefined project scopes capturing significant issues. The purpose of these scopes is to aid the scoping and identification of areas of interest across all models. A sample of the predefined scopes includes:

- SEPA
- Payments
- FATCA
- Customer Insight
- Value Chains

## Supportive Content

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

For example, requirements such as ISO 20022 can be represented by structural groupings of data elements, such as PAIN Message Definition structures, whose data requirements can be supported by Supportive Content as a mechanism for both documenting the requirements and understanding how those requirements are supported in the Vocabulary and the Process and Service Models.

Supportive Content is defined in the language of the users of the given application.

### CCPA

- CCPA Document Sections
- CCPA Document Terms
- Processing Activities / Purposes
- CCPA Term Groups
- Consumer Rights
- Personal Data
- Processing Activities
- Processing Purposes
- Roles

### GDPR<sup>1</sup>

- Rights of the Data Subject
- Security of Personal Data

- Lawfulness and Consent
- Accountability and Compliance
- Privacy by Design and Default

#### Basel Framework

- Capital Adequacy & Capital Ratio
- Capital Adequacy Framework Final Rule
- Credit Risk - Standardized
- Effective Maturity (M)
- Expected Loss (EL) And Provisions
- Exposure At Default (EAD)
- Liquidity Risk Management
- Loss Given Default (LGD)
- Market Risk - Incremental Risk Charge (IRC)
- Market Risk - Internal Model
- Market Risk - Standardized
- Operational Risk Requirement
- Probability Of Default (PD)
- Securitization Framework
- The First Pillar - Minimum Capital Requirements
- Market Risk Capital Requirement
- Credit Risk - Internal Ratings Based (IRB)
- Counterparty Credit Risk
- Global Capital Framework

#### CCAR

- FR Y-14M

#### Dodd Frank

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

- Further Definition of “Swap Dealer,” “Security-Based Swap Dealer,” “Major Swap Participant,” “Major Security-Based Swap Participant” and “Eligible Contract Participant”

#### EBA’s Data Point Model

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

#### FATCA

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

#### SEPA

- Bank to Bank Space - Supportive Content containing the data items required for the Direct Debit Rulebook DS-04 Direct Debit Collection and the Credit Transfer Rulebook DS-02 Interbank Payment Dataset.
- Bank to Customer Space - Supportive Content containing the data items required for the Direct Debit Rulebook DS-06 Customer to Bank Direct Debit Collection Credit Transfer Rulebook DS-04 C2B Information.

- Customer to Bank Space - Supportive Content containing the data items required for the Direct Debit Rulebook DS-03 Customer to Bank Direct Debit Collection and the Credit Transfer Rulebook DS-01 C2B Information.
- Reversal Events - Supportive Content containing the data items required for the Direct Debit Rulebook DS-07 Interbank Reversal Instruction for the Collection by the Creditor (there are no attributes listed for Credit Transfer Rulebook).
- Status/Reject/Return Events - Supportive Content containing the data items required for the Direct Debit Rulebook DS-05 Reject, Return or Refund of a Collection or a Reversal Credit Transfer Rulebook DS-03 Reject or Return.

#### Financial Markets

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

#### FIBO

- Business Entities
- Foundations

#### ISO 20022 Payments

- Bank Account Management
- Change or Verify Account Identification
- Bank-to-Customer Cash Management
- Exceptions and Investigation
- Notification to Receive

- Payments Clearing and Settlement
- Payments Initiation
- Payments Mandates

#### ISO 20022 Securities

- Investment Funds
- Settlement and Reconciliation

#### Other

- Legal Entity Identifier (LEI) - Identifies the common data elements required for the administration of a common system of entity identification to be used in monitoring and managing systemic risks.
- MISMO eMortgage - Supportive Content containing the data items required for the support of Mortgage Industry Standards Maintenance Organization (MISMO), a wholly owned subsidiary of the Mortgage Bankers Association. MISMO is dedicated to developing, promoting and maintaining, through an open process, voluntary electronic commerce procedures and standards for the commercial and residential mortgage industries.
- IBM Financial Transaction Manager (FTM) - identifies the data items required for FTM support.
- Securities and Exchange Commission (SEC) US Generally Accepted Accounting Principles (GAAP) support

The SEC is an independent federal agency that oversees the exchange of securities to protect investors. The US GAAP are the standard framework of guidelines for financial accounting.

# Process Analysis & Design

Financial services organizations tend to manage the same functions and execute the same processes in a number of slightly different ways. Financial services organizations that employ pre-analyzed, well-engineered process templates can redeploy some of their analysis effort into customizing their processes with reusable building blocks to create substantial competitive advantage. People and groups who benefit from using process models are those involved in:

**Process Definition** - Process models can support analysis of the current “as is” and future “to be” processes by defining the logical activities, triggers and dependencies that comprise processes and by specifying the business rules required to perform each activity. This information ensures an understanding of the complete business context (what, when, why and by whom) in which work is performed.

**Information Technology** - Process models can support the definition and analysis of information requirements for systems development. This information is essential to ensuring that systems are aligned with business needs and that the necessary systems support and infrastructure are in place to enable the business to use applications effectively.

**Change Management** - Process models can support the analysis and definition of roles, skills and training required to implement new processes. This information enables the assessment of current processes, design of future processes and construction of a plan to transform that future vision into reality. The logical design of processes in the graphical form of process diagrams aids the presentation, discussion and agreement of ideas for change among business users, consultants, analysts, system designers and managers.

BPS process model material is derived from many sources such as:

- IBM consultants who stay in close touch with the financial services industry, its organizations and associations
- IBM industry specific consultancy practices
- Dedicated IBM Industry Models Lab
- Working with international financial services organizations worldwide
- Alignment with the most current regulatory directives

BPS process model material is under constant review, regularly tested and validated during client assignments. Enhancements and additions are made continually, released via standard software release procedures to those clients with maintenance arrangements in place.

## Business Scope

Business processes are closely aligned with the project scoping component and grouped loosely into five high-level classifications:

**Relationship Management:** Relationship Management business processes directly affect customers of financial services organizations. The organization needs to manage customer relationships to find customers to whom products should be sold. This includes customer evaluation, query handling, personal selling and special customer handling.

**Account Origination and Administration:** Account Origination and Administration Business Processes directly affect the provision of services to customers. Financial services organizations need to negotiate contracts with specific identified customers, provide account administration services once the contract has been formulated and established as well as answer queries of all types in a standard way and provide channel servicing for product and service delivery.

**Risk and Compliance Management:** Risk and Compliance Management business processes show financial organizations where to rethink their business strategies and operational plans in the face of increasingly prescriptive risk and compliance regulatory requirements. The primary motivation for the multitude of risk and compliance initiatives is to enhance investor confidence and provide financial and ethical protection to the industry as a whole. BPS advocates an approach whereby senior managers understand, leverage and optimize the synergies across the various regulatory requirements.

Industry Models can support financial organizations developing an integrated, strategic, enterprise-wide approach that results in increased internal controls and corporate governance, enhanced relationships with customers, improved decision making, at lower costs. Risk and compliance management is now a key business driver that traverses many regulatory issues and bodies such as Basel II, and SEPA.

The Process Analysis & Process Design models have been extended to support the GDPR<sup>1</sup>. For example, they contain over 15 template processes for the management of personal data covering issues such as consent and the right to access, modify, and delete their data, as well the right to be forgotten. In addition, existing process model content has been extended to support data privacy requirements.

**Asset and Liability Management:** The Asset and Liability Management business processes manage activities required to:

- Research investment alternatives
- Assess the value of assets for financial services organizations or their customers to take custody of assets and administer them for the benefit of a principal
- Balance the mix of assets held by financial services organizations

- Collect debts owed by customers
- Define business processes to manage activities required to obtain funds from depositors and other creditors, and to determine the appropriate mix of funds that balances the cost of obtaining funds with the return that can be earned on those funds

**Product and Market Management:** Product and Market Management business processes show that financial organizations are operating in a highly competitive global market place. In order to develop market offerings, such as including products, channels and market segments, that will give competitive advantage and bring those offerings to the market quickly, financial services organizations need to identify gaps in the marketplace for which to analyze market opportunities and direct market communications.

#### Uses of the process analysis and design models

**Strategic planning:** Provides an accessible model of successful financial services management processes, operations and their interrelationships. Provides a framework for strategic planners to understand financial services organizations and the impacts of strategies in one area on another, to ensure that complete, consistent and integrated strategies are defined, and initiatives to implement them are effective.

**Acquisitions and mergers:** Provides a benchmark against which organizations can be compared. Once process similarities, differences and gaps are identified, the desired “to be” state and merged organizations can be effectively planned and implemented.

**Organization structuring:** With its focus on flows and interrelationships, provides a strong framework for understanding work content and interdepartmental dependencies. BPM becomes a powerful analytical approach for structuring organizations to best enable process execution and delivery of required outcomes.

**Competencies and skills identification:** Provides a sound framework against which to identify and define required enterprise competencies as well as specific skills for human resources of financial services organizations. Once specific structures have been defined, activities can be allocated to organization units, and role-skill requirements can be defined to execute those processes. Recruitment, selection, training and development needs can be more effectively identified in the process context.

**Design delivery of packaged financial services products (market offerings):** Products can be thought of as sets of conditions for arrangements delivered by processes, provides a basis for quickly and effectively packaging conditions for delivery to the market by identifying and activating the relevant condition delivery processes.

**Outsource the business:** Most traditional, integrated financial services organizations view their organizations as centrally consolidated businesses. Together with analysis of the business environment, competition and market presence (current and future). Can identify process components that can be separated from the total financial services value chain to form viable economic businesses, and find unprofitable businesses that can be outsourced or eliminated.

**Benchmark and managing best practice:** Can provide a common activity model against which an organization can measure and benchmark performance within financial services organizations and with other companies to maintain best-practice information. BPM can be used to compare and improve similar processes across organization units, geographies and lines of business.

**Costing and management accounting:** Tailored to specific contexts, provides a process base on which to develop costing and management accounting systems. The activities are pre-identified for allocation, measurement and accumulation of data at the level appropriate to the management information requirement.

**Business transformation, re-engineering:** Business transformation and business process re-engineering involve the selection, analysis, design and implementation of business solutions, addressing change requirements across Industry Model dimensions such as strategy, structure, skills, data, function, process, solution, application, network and system. Effective business engineering uses processes as the basis for design with reference to the other dimensions. It provides the basic process logic from which to design more effectively and quickly any future processes and identify specific change requirements.

**Continuous improvement:** Provides the basis for establishing performance measurement and enhancement initiatives. They can be used to develop a specific model against which process effectiveness (fitness for purpose), service level (responsiveness and service quality) and efficiency (input/output ratio) can be measured for process performance improvement.

**Specify business requirements to technologists:** Use as the basis of business process requirements gathering and analysis means that clear, well-defined, technology-functional requirements can be defined to meet business needs more completely and accurately.

**Application development and integration:** As a result of using the model for business requirements specification, application developers can analyze, design, code, test and implement applications to improve business performance. Also useful in identifying shared information flows between applications when integration is required.

**Package evaluation:** Enhanced definition of business requirements enables application software selection decisions to be made with greater clarity and confidence. The features and constraints of off-the-shelf package solutions, associated communication and hardware are more readily identified if the full current and future business requirements are clearly defined.

**Risk management:** Risk Management processes enable the identification of processes where risk may arise in the business and activities to manage the risk, including internal and external reporting where required. Broad coverage of Credit Risk, Operational Risk and Capital Adequacy, including issues such as potential employee fraud, liquidity risk due to changes in market take-up or economic conditions, changes in counter-party risk and the establishment of risk policy are all included.

### Benefits of the BPS process analysis & design models

- Brings competitive advantage to financial services organizations by helping to processing transactions more quickly and at less cost
- Reduces time to market for new product introduction
- Assists in the improvement of customer service, encouraging retention and relationship development
- Provides ready-made business process definitions with customer focus
- Includes extensive reuse of activities and processes that reduce system support and staff training requirements
- Encourages and promotes a common process language and understanding across disparate lines of business and organization units
- Eliminates redundancy in process variations
- Accelerates solution development, reducing development cost
- Provides a framework to which new products and processes can be easily added
- Provide coverage for adopting certain banking industry standards

## Value Chains

The Value Chains are a representation of a line of business functions that are supported by a set of long running business processes.

Each value chain comprises a linked sequence of phases (chevrons) in the life-cycle of a particular area of business interest, and each chevron is associated with a list of Analysis Process Model (APM) processes that are associated with that phase of the life-cycle. For example, the key functional areas covered by the value chains are:

- Retail banking
- Corporate/commercial banking
- Private banking
- Financial markets

Understanding the strategies to be achieved by an initiative is a prerequisite to scoping processes and prioritizing process customization with the following broader benefits:

- Assists in the improvement of customer service, encouraging retention and relationship development
- Helps reduce time-to-market for new product introduction
- Provides ready-made business process definitions with a customer focus
- Includes extensive reuse of activities and processes that reduce system support and staff training requirements
- Encourages and promotes a common process language and understanding across disparate lines of business and organization units
- Eliminates redundancy in process variations
- Help accelerate solution development to reduce development cost
- Provides a framework to which new products and processes can be easily added

Value chain areas scoped as core to the project, processes and activities within the models can support that area. Process scoping involves testing the relevance of each process through consideration of the:

- Organization unit performing the work
- Present methods of the process versus the prospective state
- Roles involved in process execution
- Product types supported by processes
- Customer segment served by the processes

This scoped list is a useful completeness test. Processes can also be prioritized for the project according to those that support functions most closely aligned with business strategy. Processes that support functions deemed to be peripheral to the project are only of relevance if this project acts as a requirement for the delivery of these peripheral functions.

## Analysis Process Model

The Analysis Process Model (APM) contains as much as 80% of all processes undertaken by financial services organizations trading internationally. The business processes are broadly categorized into the following value chains, representing processes that span many business functions:

- CCPA
- GDPR<sup>1</sup>
- Sales and Relationship Management
- Know Your Customer/Account Opening
- Lending
- Card Products Administration
- Commercial / Syndicated Lending
- Mortgages/MISMO

- Trade Finance
- Savings, Investments and Deposits
- Transfer Services
- Payments - Direct Debits/Credit Transfer/Deposit/Withdrawal
- Cash Management
- Wealth Management
- Product and Marketing Management
- Regulatory and Compliance
- Best Execution/MiFID
- Trade Processing
- Current Account
- Corporate Actions
- Asset and Liability Management
- Human Resource Administration

This categorization is compatible with both the Banking Business Vocabulary and IBM Banking & Financial Markets Data Warehouse, providing consistency that is propagated throughout the entire model set of the Industry Models. Each individual process represents a strand of work financial services organizations must perform to be successful. The process content represents leading practice that has been validated by financial services organizations across the world over several years. The categories outlined above are the highest level of abstraction and can be decomposed into processes, sub-processes, activities, events and flow control logic..

The process analysis & design models contain a large number of enterprise-wide, generic processes and sub-processes made up of thousands of activities and events.

Business process engineering projects involve:

- Defining the scope of the project by selecting business processes and making a working copy of the processes in scope
- Customizing the model copy by firstly applying any re-engineering optimizations, incorporating best-practice ideas, increasing parallel activities and removing unnecessary activities
- Further customizing the models by making explicit any product and channel-specific activity names
- Adding organizational roles and responsibilities by introducing so-called swim lanes into the process
- Adding technology support and constraints by introducing 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 process is required, standardization and re-usability are maximized.

For projects involved in process simplification, achieving common processes across products and channels, harmonization of processes from merged organizations, and so on, the steps outlined above are preceded by identifying strategies whereby the differing process flows are selected according to how well they can be brought into synchronization. Understanding the strategies to be achieved by a given initiative is a prerequisite for scoping processes and prioritizing process customization.

## Orchestration Process Model

The Orchestration Process Model (OPM) provides technical specifications of the processes that form the basis for downstream implementation of executable processes.

The process design phase of a project involves the design of executable processes based on the given business requirements and the analysis level processes in the APM.

The OPM is a derived model, created from the Analysis Process Model (APM) and the Service Models: Business Object Model (BOM), Interface Design Model (IDM), and Web Service Design Model (WSDM).

Whereas the APM is an analysis-level model, the OPM is closer to execution level, but is not itself an executable model.

## Service Analysis & Design

Integration issues are a major concern for financial institutions. The existing infrastructure must be retained, yet, in order to meet the demands of today's business issues, a consistent architecture is required to maximize reuse and to support the development of new initiatives. Services-oriented architecture (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. SOA can increase the speed of business changes, improve business efficiency and performance, as well as protect the privacy and security of critical information assets. SOA 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 business concepts and processes 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 BPS service models provide this common language. The models support a complete and unambiguous description of the business services required to support the financial institution. The BPS service models enable the efficient and accurate gathering of requirements, and guarantees the consistency of definitions with a single integration effort or across multiple projects.

BPS service models are tightly coupled with BPS process models, describing the underlying services that support these processes at runtime. Using the BPS service 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 common services within the organization.

### Business Object Model

The Business Object Model (BOM) provides business content and guidance for SOA analysts, designers and systems developers. It is used to clearly capture any business requirements at a detailed level. Analysis of reusable elements within business processes defined by the BPS process models allow the identification of candidate business services that support these 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 reused across the financial institution. This solution is a business service.

The service analysis model allows reusable elements within business processes to be explored further with the aim of identifying actual business services. It is structured as:

- A set of candidate services
- A model of business concepts used by these use cases

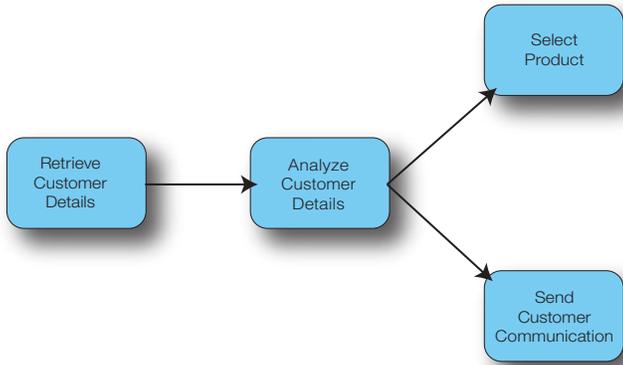


Figure 2. An example of a business process

**Candidate Services**

Reusable elements within business processes are analyzed further within the service analysis component as candidate services that aid requirements definition. These candidate services are presented as:

- High-level representations of the candidate services and the inputs and outputs of that candidate service as a whole
- Decompositions of these high-level candidate services into sequences of business activities, the interactions between these activities and key business concepts within the model



Figure 3. An example of candidate service

BPS process models provide the context in which a requirement occurs, while the candidate services in the service analysis model describe the actual requirements.

**Business Concepts**

Part of describing a requirement in a candidate service 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 and how they relate to other concepts in the model. The model contains detailed UML models describing these classes.

For example, the Customer class defines the characteristics, responsibilities and constraints that apply to every customer.

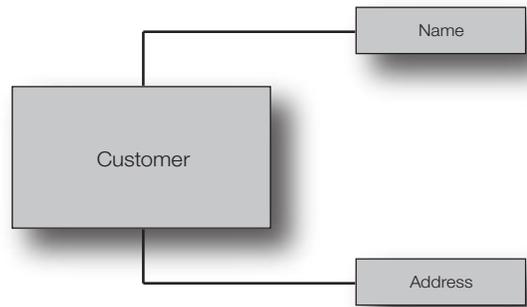


Figure 4. An example of a class

Each class comprises:

**Attributes:** 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:** 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:** Describe a relationship between two classes. For example, a `Customer` having an `Address`. Often these associations will support the operations of the model, such as `getCustomerAddress`.

These classes modeled within the service analysis model are grouped into packages that represent specific business areas, supporting hundreds of 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 candidate service 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 SOA.

### Uses of the BOM

- Capture more detailed requirements of particular business activities.
- Enforce consistency in captured requirements.
- Identify candidate services for SOA.
- Provide a point at which all business requirements can be definitively captured.

### Benefits of the BOM

- Express requirements in a structured way
- Designed to be understood by both business and IT, and acts as a communication bridge between communities
- Provides an environment in which reuse possibilities can be identified and verified
- Provides a firm basis on which integration or SOA 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

## Interface Design Model

The service design models take the analysis-level candidate services and concepts identified within the service analysis model and allow the financial institution to specify an SOA that meets these requirements. This task is normally performed by a technical team within the financial institution, who make design-level decisions based on aspects such as the technology environment. This team works from a stable service analysis model that eliminates the need for repeated requirements specification. This greatly increases the applicability of technical solutions and reduces the time to specify them.

The service design models were developed to:

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

### Business Service Groupings

The service design model is structured as a componentized model, describing units of software that satisfy specific business requirements. The actual requirements supported by a component are described as interfaces with group-related services. The components of the service design model are derived from the class models of the service analysis model, providing the detailed class definitions and relationships that describe how the component operates. The interfaces of these components are derived from the use cases of the service analysis model, describing the capabilities of these components and how they interact.

The IDM is designed to meet specific business needs, such as:

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

### Business Service Interactions

In a similar way that the service analysis model describes the sequence of business activities within a use case, the service design model describes the collaboration between services to meet a business goal. For example, the retrieveCustomerDetails service may call other, finer-grained services to perform required tasks, such as getCustomerName or getCustomerAddress. Collaborations between services are essential to a successful SOA as they prevent the definition of monolithic services that are less reusable across multiple projects.

### Uses of the IDM

- Assists in SOA design.
- Provides component definitions for software development.
- Provides messages definitions for integration development.

### Benefits of IDM

- Allows you to construct services within a formalized model.
- Provides traceability back to business requirements.
- Structured to maximize reuse of business services.
- Enables consistency of definitions.
- Provides a ready-built model so you can focus on business issues rather than building a model from scratch.

### Transfer Object Model

Defines transfer objects, which are simple Unified Modeling Language (UML) data types derived from the IDM class model. Transfer objects are used to explicitly define, at modeling time, the structure of data that will be used in Deployed services and Data objects in executable process models.

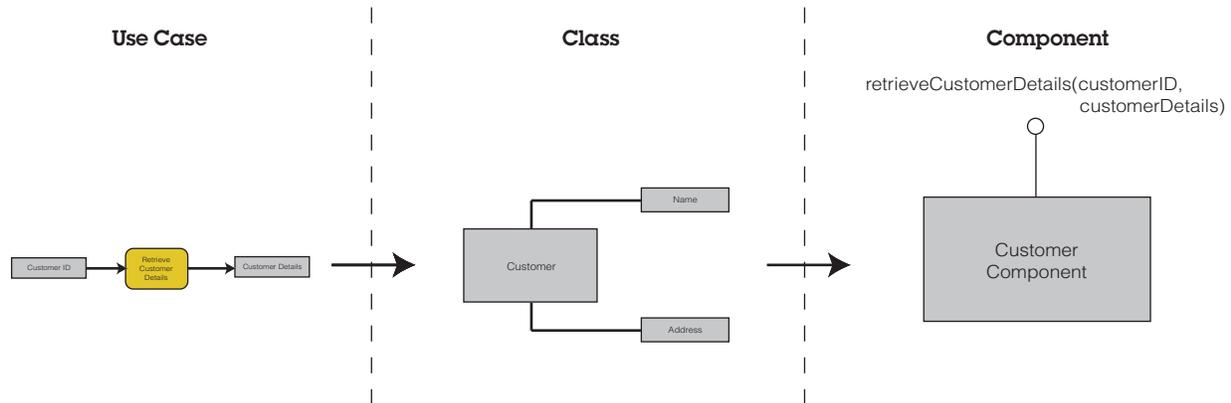


Figure 5. Defining services based on candidate services

This ability to explicitly define data structures at modeling time is a key feature of using transfer objects, rather than attempting to generate data structures directly from the IDM class model. Controlling the size and complexity of artifacts generated from a large and complex class model can be very difficult. Transfer objects can help to ensure the consistency and traceability of data structures deployed in production.

## Service & API Design Models

### Web Service Design Model

WSDM provides a design for an enterprise-wide and business-services-based architecture through the development of participants, service interfaces, and messages.

### Message Service Design Model

Message Service Design Model (MSDM) is a platform-specific model that contains definitions to enable the generation of XSD messages and commands. Messages in MSDM are derived from capability operations in BOM. Message-based XSDs and command-based XSDs generated from the MSDM can be used in a messaging environment.

Request messages can be routed to a messaging engine, which can, in turn, invoke lower-level services created from BPS. When required, a response message can be routed back to the sender. Like the other platform-specific design models, messages in MSDM do not directly reference IDM classes or interfaces. XSDs are generated from MSDM using UML-to-XSD Transformation.

### Java Service Design Model

JSDM is a platform-specific model that contains definitions to enable the generation of Java services. Service operations in JSDM are derived from capability operations in BOM. Like the other platform-specific design models, service operations in JSDM do not directly reference IDM classes or interfaces. Java is generated from JSDM using UML-to-Java Transformation in RSA.

### RESTful API Design Model

The RESTful Application Design Model (RADM) is a UML Service model which contains definitions for REST (Representational State Transfer) Applications, REST Resources and associated REST Data Objects (JSON/XML structures). RADM elements are derived from and mapped to IDM Class model elements.



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

© Copyright IBM Corporation 2019

IBM Corporation  
IBM Analytics  
Route 100  
Somers, NY 10589

Produced in the United States of America  
October 2019

IBM, InfoSphere, WebSphere, Rational and the IBM logo are trademarks of International Business Machines Corporation in the United States, other countries, or both.

Other company, product or service names may be trademarks or service marks of others. A current list of IBM trademarks is available on the web at "Copyright and trademark information" at [ibm.com/legal/copytrade/shtml](http://ibm.com/legal/copytrade/shtml).

This document is current as of the initial date of publication and may be changed by IBM at any time. Not all offerings are available in every country in which IBM operates.

THE INFORMATION IN THIS DOCUMENT IS PROVIDED "AS-IS" WITHOUT ANY WARRANTY, EXPRESS OR IMPLIED, INCLUDING WITHOUT ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND ANY WARRANTY OR CONDITION OF NON-INFRINGEMENT. IBM products are warranted according to the terms and conditions of the agreements under which they are provided.

The client is responsible for ensuring compliance with laws and regulations applicable to it. IBM does not provide legal advice or represent or warrant its services or products will ensure that the client is in compliance with any law or regulation.



Please Recycle

IMB14143-USEN-08