*IBM WebSphere Business Integration Collaborations
for Telecommunications Version 1.0
IBM WebSphere Business Integration Collaborations
Version 4.5*

Solution Overview

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Contents

Solution overview

Telecommunications companies are currently facing significant challenges that include rolling out new Internet protocol (IP) based services, reducing costs, and retaining their preferred customers. IBM^(R) WebSphere^(R) Business Integration Collaborations for Telecommunications addresses the needs of these firms by integrating manual and automated processes in order to efficiently and rapidly deliver new revenue-generating services. By streamlining and allowing the re-engineering of these processes, WebSphere Business Integration Collaborations for Telecommunications also enables service providers to significantly reduce their operating expenses and increase their profit margins.

Industry trends and challenges

The telecommunications industry has gone through an unprecedented transformation during the last two decades. Telecommunications companies today face a multitude of challenges that range from meeting competitive pressures due to deregulation, to building new networks that address changing customer needs. With significantly increased competition from resellers and new start-ups including CLECs, traditional revenue-generating services such as local and long distance services have been reduced to commodities. The telecommunication companies as a consequence face diminished margins and average revenue per customer (ARPU), in addition to heightened customer churn.

With the advent of the IP networks and gaining popularity of the Internet worldwide, the telecommunications companies have shifted their focus to building the infrastructure required to provide new services to their customers.

However, in order to turn a profit or realize the additional revenues from introducing new services several major obstacles need to be overcome, including the following:

- Inability to rapidly provision new revenue-generating services
- Lack of operational efficiency
- High cost of acquiring additional customers
- Lack of integrated operations with business partners and content providers
- Inability to differentiate services
- Inability to offer value-added bundles consisting of voice, data, and video to customers due to the presence of multiple disparate systems
- High customer churn due to poor quality of service

The obstacles listed above can be overcome through integration between various departments and processes within telecommunications companies. For this reason, telecommunications companies are focused on embedding an infrastructure that connects the disparate systems and allows for a customer-centric view of services while significantly enhancing efficiency in the operations.

Key business processes

The same key end-to-end business processes are common to most companies in the telecommunications industry. These business processes have been described in the enhanced Telecom Operation Map (eTOM) as defined by the TeleManagement Forum (TM Forum). To achieve their main goals, individual companies and the telecommunications industry as a whole must streamline these processes and ensure that their systems are able to work together to maintain efficiency and flexibility. The key end-to-end business processes in the telecommunications industry can be broken into the following categories:

- Strategy and commit
- Infrastructure lifecycle management
- Product lifecycle management
- Operation support and readiness
- Fulfillment
- Assurance
- Billing

Business integration challenges

The challenge of business integration is to provide an automatic solution that links all participants of an enterprise in order to provide end-to-end service. In this context, a participant can be an application, a unit of business information, a user, a business partner, or a business supplier. An application is a piece of software programming that provides required business functionality. Information is data that records a business transaction. A user can be either a customer who requests services from the enterprise or an employee of the enterprise who provides services to the customer. Partners and suppliers are entities who have business with the enterprise.

To meet these business integration challenges, systematic business process models are required that achieve the following results:

- Simplify internal communications and communications with suppliers and partners
- Record the ways the enterprise handles customer requests
- Identify process activities and the functional interfaces that support the activities
- Identify control points and critical performance metrics
- Improve service productivity and quality
- Introduce new process automation

**Application
Integration**

Applications

**User
Integration**

Users

**Business Process
Integration**

Business
process

**Partner
Integration**

Partners

Data Integration

Data
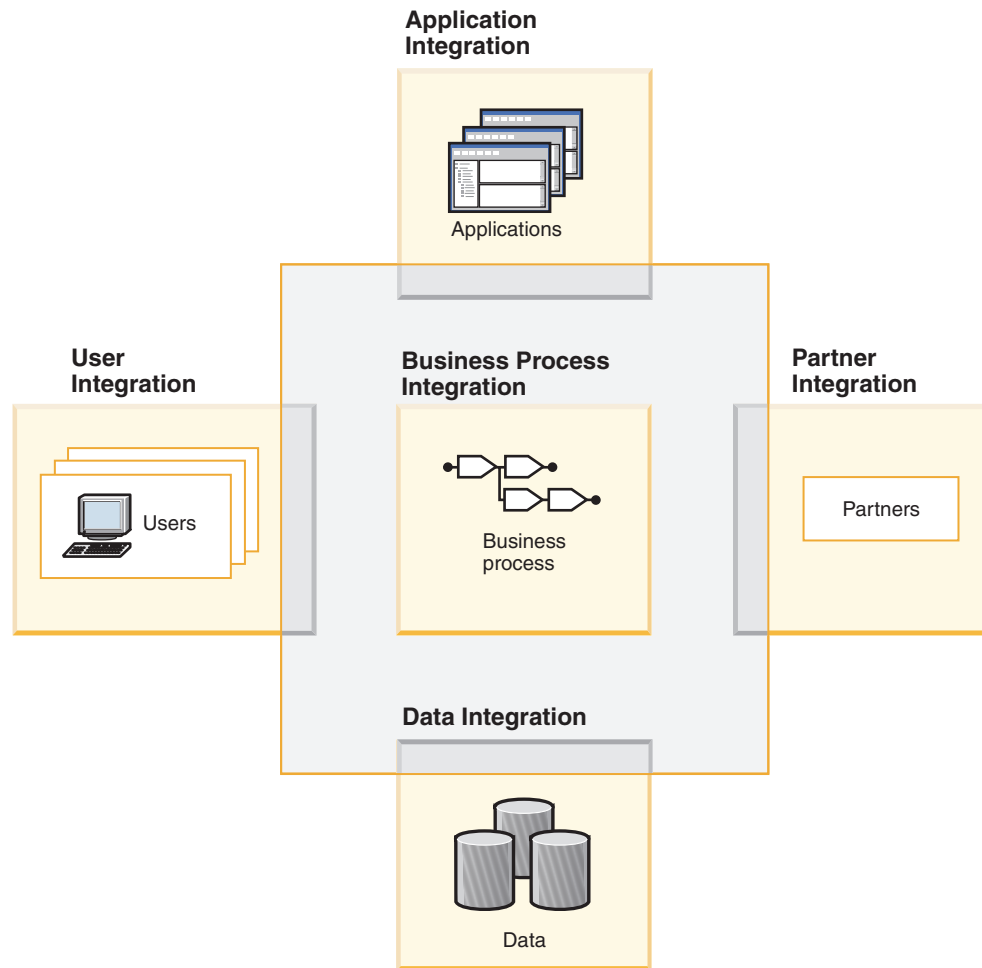
Telecommunication integration needs

Telecommunication companies now require best-of-breed solutions that link
business support systems (BSS) and operations support systems (OSS) in order to
achieve greater efficiency and to reduce costs. Industry integration solutions that
allow rapid introduction of new services without creating disruptions to the critical
operations give the services the greatest chance of success in penetrating the
market. The ability to provision services rapidly, integrate operations with partners
and content providers, and obtain a customer-centric view of various services are
key business integration priorities. Enhancing the customer experience through
sharing of data (requiring tight integration between customer order handling,
customer care, and billing applications) is a key goal for business integration in the
Telco environment. The telecommunication firms also need to attain the ability to
monitor and measure the quality of service in order to differentiate their offerings
and to provide a tiered price structure.

Solution description and benefits

WebSphere Business Integration Collaborations for Telecommunications enables
telecommunications companies to integrate business support systems and
operations support systems and to rapidly provision new services such as digital
subscriber line, wireless, and other IP services. Service providers have the ability to
deliver value-added bundles in real time to customers to seek additional revenues.

Through the use of the pre-built collaborations, the offering effectively automates business process steps of end-to-end solutions such as subscription/enrollment, configuration, and activation of services. The adapters included in the offering allow the integration of best-of-breed solutions with legacy systems in order to provide a customer-centric view of all the subscribed services.

Technical overview

WebSphere Business Integration Collaborations for Telecommunications provides a scalable framework that allows business support systems to seamlessly interact with back-end operations support systems.

WebSphere Business Integration Collaborations for Telecommunications provides not only information connectivity and integration (ICI), but also business process integration, or business process management (BPM). A choreography manager orchestrates the macro flows or sequential processing steps necessary to provision a service, and also provides support for long-running transactions or those that require human intervention. A collaboration manager manages information at the application level.

The pre-built collaborations that are provided with this solution allow the efficient flow of business processes and the synchronization of data across all relevant applications and systems using a common business object model. The advantage of the common business object model is that no application needs to be altered significantly in order to communicate with another. Information from one application is routed through the collaboration manager where the application-specific business object is converted to a generic business object which in turn communicates with other applications.

Several connectors to major ISV applications relevant to the telecommunications industry are also available to integrate the business support systems and operations support systems applications.

WebSphere Business Integration framework

The WebSphere Business Integration framework is built around three elements: people, content, and processes. People are human beings who play as a role in a business process either as a service requester (such as a customer) or as a service provider (such as an employee of the business). The content represents a set of business entities that provide the business services. A process consists of a choreography of business operations that controls the sequence in which business operations are executed.

There are many different approaches to business integration. WebSphere Business Integration solutions take the approach of integrating business processes. This is achieved by integrating enterprise applications as business service providers that support pre-defined business processes. The integrated elements comprise the solution model of an enterprise system.

WebSphere Business Integration makes application integration easier and more flexible by abstracting business process control into an entity that is separate from the applications themselves. When the business process control invokes an application, the application simply provides services as defined by its published interfaces. The control and business flow logic are separated from the application, and the start and exit conditions are moved into the business process model. The applications are thus divided into modules that are invoked by the business process manager at the appropriate points, in order to perform the program activities defined in the business process model. This approach eliminates the need for an individual application to have knowledge of the business logic associated

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with process operations, and provides the benefit of allowing business logic to be independently modified as the business evolves.

Business processes define the sequences that an enterprise uses to organize its work for customer transactions within the enterprise. This way of organizing the central activities of a business is called business process management (BPM). The sequence between business processes is called business process choreography. Once business processes are clearly defined, businesses can monitor and improve these processes accordingly. This provides enhanced control to the business person, and allows individuals to influence and change the business processes.

The eTOM business process framework

Instead of redefining a new set of business process models, IBM WebSphere Business Integration Collaborations for Telecommunications complies with an open standard. The WebSphere Business Integration Collaborations for Telecommunications business processes are built according to the enhanced Telecommunications Operations Map (eTOM) business process framework defined by the TeleManagement Forum (TM Forum).

The eTOM business process framework serves as a blueprint for process direction and as a starting point for the development and integration of business and operations support systems (BSS/OSS). eTOM explains telecommunications enterprise-level processes and sub-process in a top-down, customer-centric and end-to-end approach. It provides a neutral reference point for telecommunications service providers when they consider process reengineering needs, partnerships, alliances, and general working agreements with other service providers. The eTOM framework also outlines potential boundaries of software components and the required functions, inputs, and outputs that must be supported by their products.

The eTOM framework and its associated business process models describe the processes and their points of interconnection that make up the end-to-end operations process flows for business processes that are specific to information and communications services and technologies management.

The WebSphere Business Integration Collaborations for Telecommunications solution model

The diagram below shows a high-level view of WebSphere Business Integration Collaborations for Telecommunications solution model. The model is divided into three layers:
- Process choreography layer
- Application/information integration layer
- Applications layer

The process choreography layer and application/information integration layer are further grouped into the business integration layer. The business integration layer is the hub of the WBI solution architecture.
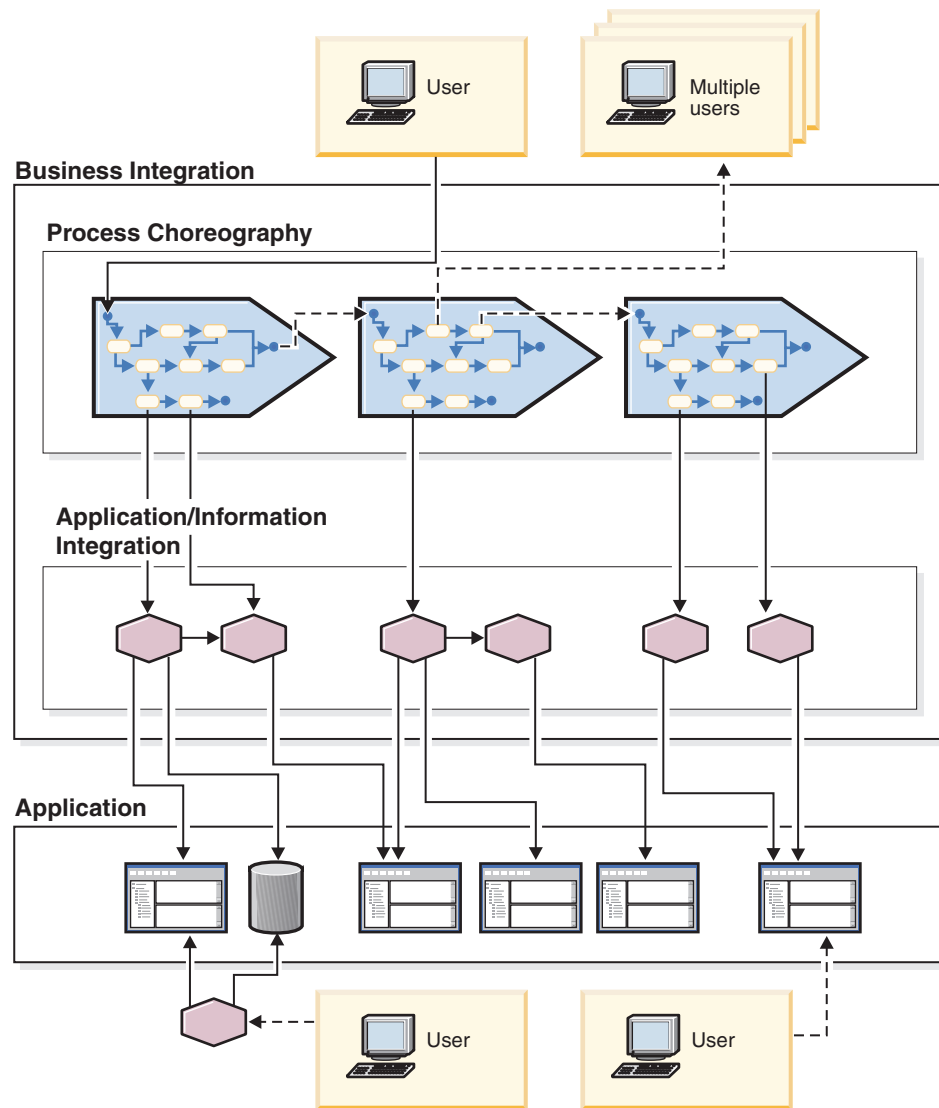
A process is a series of actions that are undertaken to produce a given result. Processes can be considered on multiple levels. At the high end, business processes are strategic processes that define the ways in which a business is run. At the lowest end, there are operational processes that can contain a single transaction, wrapped in business logic. Between the two ends are different levels of processes called collaboration processes that fall between the operational and the strategic model.

As shown in the diagram above, the process choreography layer consists of a set of business process models. A business process model represents a business process.

The application/information integration layer shown in the diagram above consists of a set of collaboration models. Each collaboration model defines an integration process for application business functions or information.

Finally, the applications layer consists of applications that provide business services (or operational processes) required by business processes.

The following diagram shows the specification of the sub-models that comprise the total WebSphere Business Integration Collaborations for Telecommunications Business Integration solution model, and the artifacts that contain groupings of each of the sub-models.
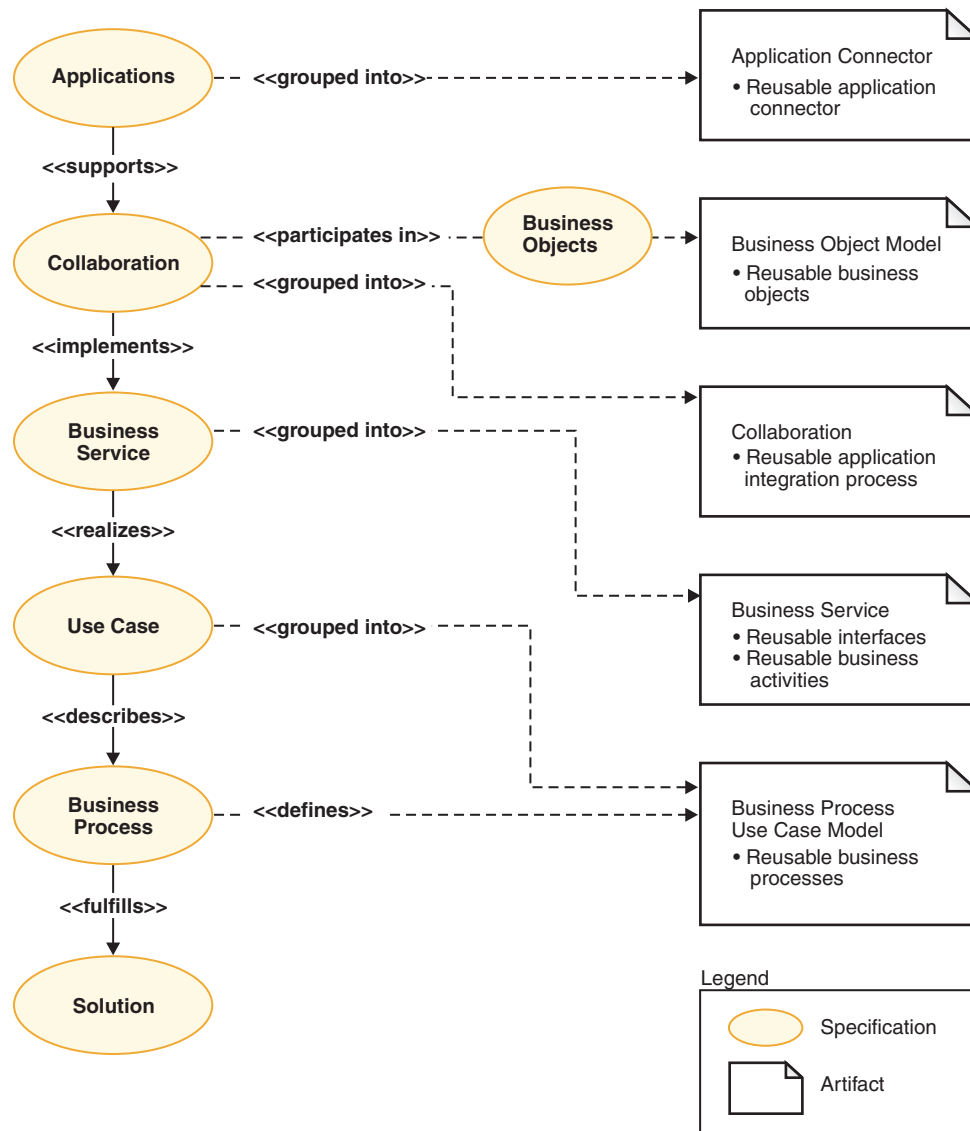
The following sections describe the details of each of the elements of the solution model.

Business process model

The use of systematic business process models makes it easier to evaluate and improve the business process themselves. Employing business process modeling techniques brings efficiency improvements and removes barriers within organizations and across cooperative, internal organization projects.

Instead of redefining a new set of business process models, WebSphere Business Integration Collaborations for Telecommunications is compliant with an open standard. The WebSphere Business Integration Collaborations for

Telecommunications business processes are built according to the eTOM business process framework defined by the TeleManagement Forum (TM Forum).

End-to-end business processes can be divided into many business processes called process elements. The process elements are building blocks that can be used to assemble end-to-end business processes such as a fulfillment, assurance, or billing. The WebSphere Business Integration Collaborations for Telecommunications solution delivers such building blocks in order to provide the maximum flexibility and speed when integrating a business process management solution. These building blocks are business process models.

A business process consists of a choreography of business activities. This choreography specifies the following information:

- The sequence of processing from one business activity to another
- The responsibility of participants to provide the required services for each activity
- The information required as inputs to activities

Business processes manage and monitor how a business process is executed, and they require the support of all participants in the process. However, business processes do not specify how an individual activity is done.

A business activity can be classified as a manual activity or an automated activity. An manual activity represents a user interaction. An example of a manual activity is a work item for a customer service representative (CSR) to perform a credit check on a customer. An automated activity includes a business operation performed by an application, such as sending new customer information to the CRM application.

An automated activity requires the support of one or more applications that are business process participants. Normally this can be achieved by sending one or more requests for business functions to applications or application components. A business function is a unit of operation by an application with specific, well-defined inputs and outputs. Functions tend to be dedicated to a single purpose. For classification and implementation purposes, business functions with related or complementary capabilities are grouped into function groups.

The eTOM framework only defines the business activities inside each process element. It does not propose any choreography of process elements. However, each of the WebSphere Business Integration Collaborations for Telecommunications business process models includes a proposed choreography. It is assumed that the choreography of a business process can change over time, and can be different from one organization to another. The proposed choreography therefore does not attempt to define a standard choreography. It is provided as a reference or a template for easy implementation. The WebSphere Business Integration Collaborations for Telecommunications business process definition tools provide the flexibility to modify the choreography.

Use case model

A use case model describes the details of the business process model. It is the specification of a business process that describes its various requirements. In WebSphere Business Integration Collaborations for Telecommunications, use cases also show the predefined interrelations of the business activities contained within a business process.

Business services

Business services provide a model of interfaces that are accessible by a business process. These interfaces hide the implementation details of the business services.

An automated business process activity invokes a business function in order to obtain a business service. The business functions that are invoked by business process activities are normally aggregate functions that can be further divided into functions provided by applications. WebSphere Business Integration Collaborations for Telecommunications uses collaborations to aggregate application-level functions.

The aggregate function described above has a one-to-one relation with a business process activity. Each aggregate function represents a possible high-level business service that can be achieved by underlying applications. The business service is therefore a very useful reference model for determining business process activities that can be achieved. Aggregate business functions, like simple business functions, are also defined as functional interfaces. A functional interface defines the input and output condition of the interface and the services it provides.

WebSphere Business Integration Collaborations for Telecommunications groups the aggregate functional interfaces into the business services so that the business service can be used as a reference for modeling new business processes. In other words, business services can be treated as a reusable model for automated business activities. It can also be used to link business process activities to business functions, making it a good reference for defining collaboration models.

For a complete list of the business services that WebSphere Business Integration Collaborations for Telecommunications provides, refer to the Business services section in the Solution Implementation Guide.

Business object model

A business object is defined as a piece of information or data that is relevant to a business and that needs to be stored and used across multiple business transactions. Some of these objects are of interest only to a single application, in which case the business object can be stored by that application's private data store.

A business object can be transferred from one application to another application or from one user to another user during the course of a business process. On the other hand, multiple applications may make use of the same business object for different purposes. Any business object shared in one of these ways should be considered as a shared business object.

In WebSphere Business Integration Collaborations for Telecommunications this business information is shared between individual applications by a business object model. The business object model represents all the business objects in the current release. Each business object in the business object model represents an item of business information required within the telecommunications domain. It has well defined attributes can be mapped to the application-specific attributes.

Collaboration

A business activity is supported by an aggregate business function. The aggregate business function is turn around supported by one or more fine-grain functions

performed by applications. A collaboration model models the aggregation process of invoking fine-grain functions. It also synchronizes shared information in disparate applications.

A function group is a collection of related and complementary business functions. For reusability, a collaboration normally models a function group rather than a single business function.

Collaboration models can play two roles: A collaboration model can be a service provider of a business process activity, or it can be a service consumer that uses services provided by a business process.

In WebSphere Business Integration Collaborations for Telecommunications, if a collaboration is a service provider, its implemention conforms to an interface that is modeled in a business service.
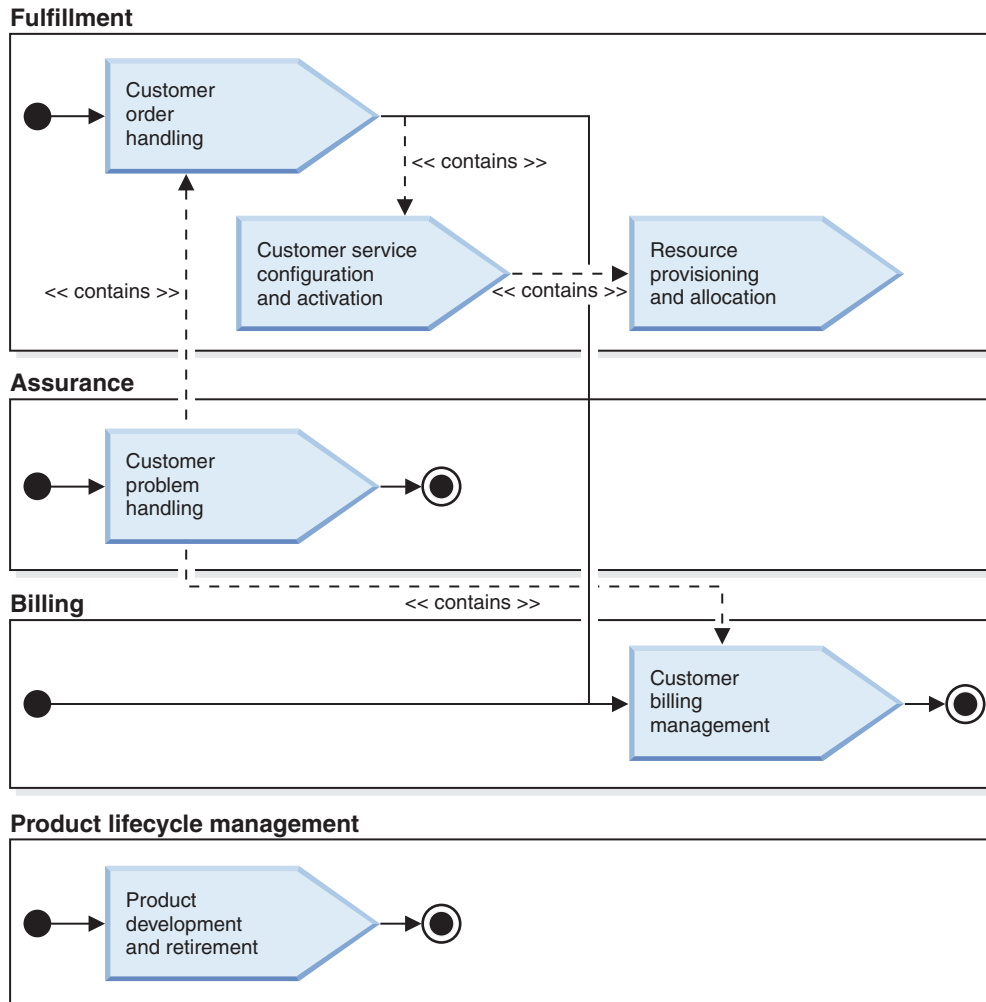
Applications

WebSphere Business Integration Collaborations for Telecommunications treats applications as resources of the solution that can be integrated in order to support specific business processes. In order to make the integration easy and flexible, business process flows are separate from the applications themselves. This approach eliminates the need for individual applications to have knowledge of the business logic associated with process operations.

Some applications have business processes embedded inside the application that can not be separated from the application. When this is the case you can either choose not to use the application in order to maintain centralized control, or if the embedded business processes is equivalent to a business process provided by WebSphere Business Integration Collaborations for Telecommunications, you can treat the embedded business process as an external business process that is directly called from an end-to-end process. If the embedded process is only a part of a larger WebSphere Business Integration Collaborations for Telecommunications business process, you can modify that business process so that the embedded business process is also embedded inside the WebSphere Business Integration Collaborations for Telecommunications business process.

Collaborations

WebSphere Business Integration Collaborations for Telecommunications contains collaborations that represent a business process, and contain one or more collaboration templates at the application/information integration level. The interaction between collaborations is shown in the following diagram.

Fulfillment

Customer order handling

<< contains >>

Customer service configuration and activation

<< contains >>

<< contains >>

Resource provisioning and allocation

Assurance

Customer problem handling

Billing

<< contains >>

Customer billing management

Product lifecycle management

Product development and retirement

IBM WebSphere Business Integration Collaboration for Product Development and Retirement

This collaboration manages creation or retirement of services for the telecommunications industry. Addition and subtraction of services can be easily managed through the use of this collaboration, allowing the rapid introduction of new services. When this collaboration adds a new product to the product catalog, it verifies product information and makes the product available for sale.

IBM WebSphere Business Integration Collaboration for Customer Order Handling

This collaboration manages customer information and order information to streamline order handling activities for the telecommunications industry. The managed information is used to process the order, and to authenticate and set up requested services, thereby minimizing the time and effort required to perform these processes. The collaboration enables the synchronization of customer records across various applications such as customer relationship management and billing. The collaboration validates the requested service for the specified geography and then allows the customer service representative to enter the order in the order management system. Next, the collaboration synchronizes the customer information across front office, back office, and partner systems, and invokes the

service configuration system. Once the ordered service is provisioned, configured, and updated, this collaboration updates the billing record of the customer.

IBM WebSphere Business Integration Collaboration for Customer Service Configuration and Activation

This collaboration manages configuration details for activating a service for the telecommunications industry. This collaboration enables the setup and activation of various services such as DSL and wireless, tests the delivery of the services, and processes the order once configuration and activation is complete.

IBM WebSphere Business Integration Collaboration for Resource Provisioning and Allocation

This collaboration manages the setting up of work orders for field work and installation of services and equipment in the telecommunications industry. By using this collaboration the telecommunications firm can reduce the lag time between steps of taking a service order and setting up field work After delivery and installation of equipment, the configuration details record is synchronized with the service order application, thereby allowing the field technician to record completion of work.

IBM WebSphere Business Integration Collaboration for Customer Billing Management

This collaboration manages the billing accounts for customers for the telecommunications industry. When a billing problem is reported, this collaboration allows the telecommunications firm to manage the billing accounts in question until the problem has been resolved. When a service is activated, this collaboration allows the telecommunication firms to activate the billing cycle for the billing account.

IBM WebSphere Business Integration Collaboration for Customer Problem Handling

This collaboration manages all problems reported by customers, including those associated with orders, services, and billing for the telecommunications industry. This collaboration allows an organization to track resolution or progress in solving customer problems. This collaboration routes customer problem reports to the problem management system and then handles the problems appropriately based upon type of service and difficulty.

IBM WebSphere Business Integration Collaboration for Fault Resolution

This collaboration manages the detection and resolution of resource and service problems, correlation of customer problem reports with known problems, and notification of the customers when problems have been resolved.

IBM WebSphere Business Integration Collaboration for Service Usage

This collaboration manages end user requests for an online service, such as an online video, and provides the requested service. This collaboration works with a credit authentication system to validate that the user is eligible to receive the service, a QoS provisioning system to provide the service, and a usage management system to record usage data for the user's account.

Business example

The following example shows how WebSphere Business Integration Collaborations for Telecommunications enables the rapid provisioning of new services.

A client submits an order through a customer service representative, a call center, or through a web portal. IBM WebSphere Business Integration Collaboration for Customer Order Handling manages the request and routes it appropriately either for automated provisioning or sets up a technician work order to do provisioning at the customer premise. The significant reduction in the provisioning cycle that this example demonstrates has the added benefit of improved customer service ratings, as the client is able to avoid lengthy delays in obtaining his or her service.

◉ Related concepts

- Solution architecture
- Solution implementation guide

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