

**WA1362 Service Oriented
Architecture (SOA) Immersion
Bootcamp**

Student Labs

Web Age Solutions Inc.

EVALUATION ONLY

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Lab 1 - Quiz/Answer

Part 1 - Questions

Chapter - Case for Change

1. SOA is based on standards developed by IBM, Microsoft, Ariba, Sun and BEA.
 - a. True
 - b. False

2. The following is true about SOA (Select all that apply):
 - a. SOA ensures interoperability by supporting multiple disparate back ends.
 - b. SOA is based on standards developed by IBM and Sun Microsystems.
 - c. SOA is a wrapper over Web Services.
 - d. All of the above.

3. In SOA, applications are exposed as _____ to communicate with other applications.
 - a. Services
 - b. Objects
 - c. None of the above
 - d. Processes

4. One of the reasons to move to SOA is that new requirements cannot be adequately implemented in a legacy environment.
 - a. True
 - b. False

Chapter – SOA Fundamentals

1. In SOA, a service is a collection of functions that is well-defined, self-contained, usually stateless.

- a. True
- b. False

2. SOA is the latest Object Oriented technology available on the market.

- a. True
- b. False

3. TIBCO BusinessWorks is an example of (Select 1)

- a. USS project
- b. ICC system
- c. SOA
- d. ESB product

4. SOA is a methodology for building applications that combine several other applications.

- a. True
- b. False

5. The language used to describe business process flows is (Select 1):

- a. Java
- b. BPEL
- c. WSDL
- d. XML

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Chapter – SOA Case Study

1. The top-down approach is typically used to implement web services when (Select 1):
 - a. Dealing with new application development scenarios
 - b. An existing application has to integrate with different applications running on disparate back-ends
 - c. None of the above

2. The primary motivation for using bottom-up approach to implement services is (Select 1)
 - a. Association
 - b. Maintenance
 - c. Integration
 - d. Extensibility

3. The best way to hand over the basic design of business processes to developers for implementation is by (Select 1)
 - a. Sending the document containing requirements in plain text.
 - b. Exporting a BPEL document
 - c. Exporting the WSDL files
 - d. None of the above.

4. In our case study, for STC, the biggest advantage of integrating the various systems that reside among different acquired companies is (Select 1)
 - a. Reusability
 - b. Extensibility
 - c. Maintenance cost savings
 - d. Saving Acme's costs thus driving the prices down

Chapter - ESB and SOA Patterns

1. When invoking services, the following provide loose coupling.
 - a. Language neutral
 - b. Location neutral
 - c. Protocol neutral
 - d. Environment neutral
 - e. All of the above
 - f. a, b and c

2. BPEL4WS does not allow a task in the process workflow to be a service.
 - a. True
 - b. False

3. Re-use of prior approaches to begin most major new projects is not recommended.
 - a. True
 - b. False

4. The following pattern is driven by the customer's requirements and describes how the application components and data within a Business pattern or Integration pattern interact
 - a. Composite pattern
 - b. Application pattern
 - c. Runtime pattern

5. The following pattern facilitates separation of process logic from application logic that is distributed across organization boundaries
 - a. Exposed Serial Process Application pattern
 - b. Exposed Direct Connection Application Pattern
 - c. All of the above
 - d. None of the above

Chapter - SOA Benefits

1. The relationship between web services and SOA is that of (Select 1):
 - a. Rival technologies
 - b. Complementary technologies
 - c. SOA represents a framework and web services represent one technology to implement it.
 - d. Web Services represents the framework and SOA represents the technology to implement it.

2. One of the goals of web services is to create large tightly coupled services that can communicate with each other.
 - a. True
 - b. False.

3. SOA can be implemented side-by-side with existing EAI applications.
 - a. True
 - b. False

4. The benefits of SOA are (Select 1)
 - a. Reduction in integration expense
 - b. Increase reusability
 - c. Integration of Legacy Systems
 - d. Data Format Translation
 - e. All of the above.

5. SOA introduces the concept of one process and multiple services in a one-to-many relationship.
 - a. True
 - b. False

Chapter - SOAD

1. Identify the well established OOAD principles among the choices below (Select 1)
 - a. Abstraction
 - b. Encapsulation
 - c. Modularity
 - d. All of the above
 - e. None of the above
 - f. a & c

2. The Encapsulation principle of OOAD allows one to (Select 1)
 - a. Hide details, and expose invocable functionality
 - b. Hide functionality, and expose details

3. Why OOAD principles are not enough for SOAD (Select 1)
 - a. SOAD creates services that are coarser-grained than OOAD classes
 - b. SOAD differs much from OOAD, OOAD principles are old and outdated for SOAD
 - c. SOAD has more stringent performance requirement compared to OOAD

4. Arrange these objects in the order of finer to coarser grained objects (Select 3)
 - a. Service
 - b. Class
 - c. Process

5. Identify two of the steps that belong to the SOAD methodology (Select 2)
 - a. Service identification
 - b. Class identification
 - c. Process implementation
 - d. Design of service deployment architecture

Chapter - Software Methodology

1. RUP follows the
 - a. Waterfall model
 - b. Iterative Model

2. Identify two phases of the RUP process from the list below
 - a. Inception
 - b. Elaboration
 - c. Implementation
 - d. Test

3. What is the difference between analysis and design
 - a. Analysis focuses on the implementation, whereas design focuses on the business domain
 - b. Analysis focuses on the business domain, whereas design focuses on the implementation

4. TRUE or FALSE
“Equal amount of time is devoted to the four phases of the Rational Unified Process – Inception, Elaboration, Construction and Transition”.

5. Which stage of SOAD methodology maps to the Inception phase of the Rational Unified Process (RUP)
 - a. Stage 1
 - b. Stage 2
 - c. Stage 3
 - d. Stage 4

Chapter - Business Modeling and Use Cases

1. In the Use Case model, a user can be (Select 1)

- a. A human
- b. A system
- c. All of the above
- d. None of the above

2. TRUE or FALSE

“Business use cases reside at a higher level of abstraction than System use cases”

3. TRUE or FALSE

“A use case is different from a feature. A use case always allows an user to achieve something that is of value to the user”

4. A system requirement consists of a use case model and a Supplementary Specification document. Which of the following requirements do you think belong to the Supplementary Specification document? (Select 3)

- a. Performance
- b. Usability
- c. GUI details
- d. Supportability

5. Identify some of the sections that a Use Case contain (Select 3)

- a. Basic flow
- b. Alternate flow
- c. Service Level Agreement
- d. Pre-condition

Chapter - Service Identification

1. In the designers world, the business functional areas map into (Select 1)

- a. Services
- b. Subsystems
- c. Processes
- d. Classes

2. TRUE or FALSE

“Functionalities in the services must be user callable”

3. The cardinality of the mapping between services and WSDL files are (Select 1)

- a. 1:1
- b. 1:N
- c. N:1
- d. N:N

4. The cardinality of the mapping between number of XML schema files and service operations are (Select 1)

- a. 1:1
- b. 1:N
- c. N:1
- d. N:N

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Chapter - Creating and Using XML

1. The evolution of text based Markup languages started with (Select 1)
 - a. XML
 - b. HTML
 - c. SGML
 - d. CML

2. XML tags are predefined
 - a. True
 - b. False

3. The following is used to manipulate XML documents for presentation (Select 1)
 - a. Document Type Definition (DTD)
 - b. Tags
 - c. Cascading Style Sheet (CSS)
 - d. XML Schema Document

4. The following is used to express Stylesheets (Select 1)
 - a. XML
 - b. Namespaces
 - c. XSL
 - d. SGML

5. Elements having identical names are differentiated using (Select 1)
 - a. Namespaces
 - b. Tag attributes
 - c. XPath
 - d. XSLT

Chapter - XML Schema

1. XML Schema is a replacement for DTDs (Select 1)

- a. True
- b. False

2. The following uses XML schema to define the data types of messages used by a service operations (Select 1)

- a. SOAP
- b. UDDI
- c. WSDL
- d. None of the above

3. The top level element in a schema file is (Select 1)

- a. <xsd>
- b. <schema>
- c. <xml>
- d. None of the above

4. Abstract data types are defined using the following tag (Select 1)

- a. <xsd:abstractType>
- b. <xsd:simpleType>
- c. <xsd:complexType>
- d. <xsd:abstract>

5. Restrictions can be placed on a schema document using (Select 2)

- a. <xsd:restriction>
- b. <xsd:enumeration>
- c. <xsd:limit>
- d. <xsd:range>

Chapter - WSDL

1. A WSDL file has the following two sections (Select 2)
 - a. Abstract description of operations
 - b. Concrete implementation of the service
 - c. Abstract description of network
 - d. Concrete implementation of UDDI registry

2. The <message> element in a WSDL file is used to represent (Select 1)
 - a. Request & Response
 - b. Single and Multiple operations
 - c. Location of a service
 - d. All of the above
 - e. None of the above

3. The location of a service is specified using (Select 1)
 - a. <binding>
 - b. <service>
 - c. <message>
 - d. <definition>

4. The WSDL document specifies the location of the service and the operations (or methods) the service exposes.
 - a. True
 - b. False

5. WSDL stands for (Select 1)
 - a. Web Services Definition Language
 - b. Web Services Description Language

Chapter – Service Design and Implementation

1. Identifying system level use cases starts from (Select 1)
 - a. Business level use case
 - b. The WSDL files created in Stage 2
 - c. The schema files created in Stage 2
 - d. None of the above

2. A class (such as Employee) contains (Select 2)
 - a. Common behavior (such as Gets Salary)
 - b. Common properties (such as Age)
 - c. Instance Specific behavior (such as Bill Can Play Soccer)
 - d. Instance specific properties (such as Bill has 3 dependents)

3. The cardinality of the relationship between classes and objects is (Select 1)
 - a. 1:1
 - b. 1:N
 - c. N:1
 - d. N:N

4. The class diagram contains (Select 2)
 - a. Class name
 - b. The attributes
 - c. The interaction among the objects
 - d. The state changes that a class goes through (for example the states of a traffic light)

5. Once the class diagram is done, it can be typically handed over to the following person for implementation (Select 1)

- a. Architect
- b. Designer
- c. Developer

Chapter – SOAP

1. Specific information about a SOAP message such as Authentication is specified in (Select 1)

- a. Message Body
- b. Message Header
- c. Message Faults

2. SOAP can be used with the following protocols (Select 1)

- a. HTTP
- b. JMS
- c. SMTP
- d. FTP
- e. All of the above
- f. a, b & c

3. The SOAP Body of a message includes

- a. Request data
- b. Response data
- c. Optional Fault element for reporting errors
- d. All of the above
- e. a & b

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4. The two communication styles supported by JAX-RPC that determine how the request and response data is specified within the body are

- a. RPC Literal
- b. RPC Document Literal
- c. <SOAP-ENV:Envelope>
- d. Document Literal
- e. a & b
- f. a & d

Chapter - Development Methodology

1. WSDL files cannot be created from existing applications

- a. True
- b. False

2. Greenfield methodology is used when (Select 1)

- a. Both interface specifications (WSDL) or implementation exist
- b. Interface specifications (WSDL) exists but the implementation does not exist
- c. Neither interface specifications (WSDL) or implementation exist
- d. Implementation exists but not the interface specifications

3. Which of the following is true when using the bottom-up scenario (Select 1)

- a. The business logic is already available from a legacy application and it needs to be externally available using web services
- b. The service definition (WSDL) already exists and the business logic needs to be created from it
- c. None of the above

4. A semi-static client (Service Requestor) implies (Select 1)
- a. The service definition is not known at compile time but the endpoint is known beforehand.
 - b. Both the service definition and the endpoint are known at compile time.
 - c. Both the service definition and the endpoint are determined at runtime
 - d. The service definition is known at compile time but the endpoint is determined at run time
5. Availability is a major concern in this phase of the software lifecycle
- a. Deploy
 - b. Build
 - c. Execute
 - d. Test

Chapter - Process Implementation

1. Which one of the following document formats is the best option for communicating the business process model from the business analysts to the developers? (Select 1)
- a. XML
 - b. WSDL
 - c. BPEL
 - d. Visio diagram
2. In BPEL a partnership between two systems is described using the following tags. (Select 1)
- a. <partnerType> <partner>
 - b. <partnerLinkType> <partnerLink>
 - c. <partnership>
 - d. None of the above

3. How is the state of a process preserved? (Select 1)
- a. By designing custom tables in the database and specifying the table names in the BPEL document.
 - b. By declaring variables for the process in the BPEL document.
 - c. A process is inherently stateless and can not have any state.
 - d. Using JavaScript.
4. Which one of the following is not a valid activity of a process? (Select 1)
- a. Receive activity
 - b. While activity
 - c. Invoke activity
 - d. Yield activity
5. In "Phase II - Process Definition" the primary concern of the developers is: (Select 1)
- a. To model the business process.
 - b. To draw the business process diagram.
 - c. To provide all the necessary information about each activity. Such as the end point (host name and port number) information of a web service.
 - d. To run simulation of the process to optimize cost.

Chapter – Testing Fundamentals

1. Some of the common types of bugs in relation to SOA are (Select 1)
 - a. Wrong result
 - b. Documentation
 - c. Stress related errors
 - d. All of the above
 - e. a & c
 - f. b & c

2. Bug reports should be promptly sent via email.
 - a. True
 - b. False

3. A good problem report should be judgmental
 - a. True
 - b. False

4. As a best practice, weekly bug review meetings must be held. Typical attendees should be (Select 3)
 - a. Project Managers
 - b. Developers
 - c. QA Manager
 - d. Architect

5. As a best practice, developers should change the severity/priority of a bug based on it's functionality

- a. True
- b. False

6. The Use-Case diagram captures the key parts of the functionality of the system that involves interaction of the users with the system

- a. True
- b. False

7. The Supplementary specification captures the following (Select 1)

- a. Reliability & Usability
- b. Performance
- c. Information about operating systems
- d. Compatibility requirements
- e. Design constraints
- f. All of the above
- g. a, c, e & f

8. In a good test document the following need to be defined for the exception scenarios (Select 3)

- a. Severity
- b. Priority
- c. Likelihood
- d. Number of failed runs

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9. The test plan should not contain the features not to be tested
- a. True
 - b. False
10. A test plan should contain the following (Select the best options)
- a. Approvals
 - b. Staffing and training needs
 - c. Test deliverables
 - d. Suspension Criteria And Resumption Requirements
 - e. Test items
 - f. All of the above
 - g. a, c, d & e

Chapter – SOA Testing

1. An entity can only be a service provider or a service consumer
- a. True
 - b. False
2. Stress testing comprises of the following areas (Select 2)
- a. Stress testing
 - b. Functional testing
 - c. Integration testing
 - d. Performance testing

3. Functional testing answers the following questions (Select the best answer(s))

- a. Does the software work in the exception scenarios?
- b. Does the software check for memory leaks?
- c. Does the software work with the boundary conditions?
- d. a & b
- e. a & c
- f. b & c

4. Synchronization problems are detected in (Select 1)

- a. Performance testing
- b. Stress testing
- c. Functional testing
- d. Unit testing

5. Security penetration testing is integrated with the following form of testing to cover all scenarios (Select 1)

- a. Unit testing
- b. Functional testing
- c. Stress testing
- d. Performance testing

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Chapter – SOA Testing Tools

1. The main purpose of testing tools are to inform and correct WSDL not conforming to standards

- a. True
- b. False

2. Web services that work in a work flow scenario cannot be tested due to complexities involved

- a. True
- b. False

3. The following SOA test tool can test the web service with penetration attacks and analyze the responses. (Select 1)

- a. SOA Test
- b. e-Test Manager Enterprise
- c. Optimyz
- d. SOAPscope

4. The following tool provides a concept of workspace to share test results and re-run the same later. (Select 1)

- a. SOA Test
- b. e-loader
- c. SOAPScope
- d. None of the above

5. WSDL is too complex to be directly understood by present day SOA tools

- a. True
- b. False

Part 2 - Answers

Chapter - Case for Change

1. b
2. a
3. a
4. a

Chapter – SOA Fundamentals

1. a
2. b
3. d
4. a
5. b

Chapter – SOA Case Study

1. a
2. c
3. b
4. c

Chapter - ESB and SOA Patterns

1. e
2. b
3. b
4. b
5. a

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Chapter - SOA Benefits

1. c
2. b
3. a
4. e
5. a

Chapter – SOAD

1. d
2. a
3. a
4. b, c, a
5. a, c

Chapter - Software Methodology

1. b
2. a, b
3. b
4. FALSE
5. a

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Chapter - Business Modeling and Use Cases

1. c
2. TRUE
3. TRUE
4. a, b, d
5. a, b, d

Chapter - Service Identification

1. b
2. TRUE
3. a
4. a

Chapter - Creating and Using XML

1. c
2. b
3. c
4. c
5. a

Chapter - XML Schema

1. a
2. c
3. b
4. c
5. a & b

Chapter – WSDL

1. a & b
2. a
3. b
4. a
5. b

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Chapter – Service Design and Implementation

- 1. a
- 2. a, b
- 3. b
- 4. a, b
- 5. c

Chapter – SOAP

- 1. b
- 2. e
- 3. d
- 4. f

Chapter - Development Methodology

- 1. b
- 2. c
- 3. a
- 4. d
- 5. c

Chapter - Process Implementation

- 1. c
- 2. b
- 3. b
- 4. d
- 5. c

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Chapter – Testing Fundamentals

1. d
2. b
3. b
4. a, c & d
5. b
6. b. Captures all the functionality, not just the key parts
7. f
8. a, b & c
9. b
10. f

Chapter – SOA Testing

1. b
2. a & d
3. e
4. b
5. b

Chapter – SOA Testing Tools

1. b
2. b
3. a
4. c
5. b

EVALUATION ONLY

Lab 2 - Developing Business Use Cases

What this exercise is about

A business use case captures a business process. A process is a sequence of activities that eventually produce a certain results. Consider the call center of an insurance company. Every call that comes in results in some kind of a business process to begin depending on what the caller wants to achieve:

1. Get a quote for auto insurance
2. File a claim
3. Change mailing address
4. Add someone as a secondary driver

In this lab, we will first look at the various needs of a business. We will then identify the business use cases. We will then develop these use cases in details.

What you will be able to do

- Identify use cases from general business communications such as e-mails and case studies.
- Develop business use cases.

Part 1 - The Case Study

A case study is a general document that outlines the needs and problems a business is currently facing. It does not have to follow any specific format. Here we will describe a case study that is quite common among businesses in real life. In fact, the case study comes from various interactions captured by a standards body called RosettaNet (www.rosettanet.org).

A business (from now on referred to as buyer organization or just buyer) procures goods from another businesses (from now on referred to as seller organization or just seller). This seemingly simple transaction requires many different interactions between these two businesses. To limit the scope of this lab, we will cover only some of the interactions.

Problem 1. The buyer needs to obtain the most accurate information about the products offered by the seller. It is not just sufficient for the seller to offer a web site where information is current. This is because, the buyer buys products from many different vendors. The buyer will like to set up its own e-commerce web site that will aggregate products from these vendors. A very good solution to this problem is for the seller to periodically publish its catalog to all buyer organizations. That is an electronic equivalent of mailing printed catalogs.

Problem 2. When time comes for the buyer to procure an item, it needs to query one or more sellers offering the item for a price quote and availability report. This query can be done automatically by a software system or by a human user using the buyer's portal web site. Presumably, the seller with lowest lead time and cost will get the order.

Problem 3. The staff from the buyer organization builds a shopping cart in the portal web site. Finally, the order placed. At this point, the portal web site must transfer the shopping cart to the seller organization. A shopping cart is essentially a collection of items and requested quantities.

Problem 4. After the order is placed, the buyer should be able to query the status of the order. Some of the items may be backordered and shipped separately. As a result, status of each item ordered must be returned separately.

Part 2 - Develop the Business Use Case

For this lab, each problem is bite sized and can be expressed in a single use case. In real life, each problem can be quite complex and require several use cases. For each problem described above, develop a business use case that captures the interaction between the buyer and the seller. For each interaction, document the data that is sent and received. Take a look one or two solution use cases below to get some idea.

After the use cases are developed, show them to the instructor and ask for comments.

Part 3 - Use Case Solutions

UC001 Propagate Product Catalog

Description

This use case allows sellers to publish their product catalogs to the buyer organizations. This allows a buyer to setup a local system that aggregates catalogs from many sellers. Employees from the buyer organization can browse through the aggregated catalog and place orders.

Actors

1. Buyer organization (or just buyer).
2. Seller organization (or just seller)

Main Flow

The seller composes a message with the following information.

- The business ID of the seller.
- The catalog ID.
- For each item in the catalog
 - Product Stock Keeping Unit (SKU)
 - Description
 - Category identifier (such as Digital Cameras or Printers).
 - List price

The message is sent to the buyer. The buyer receives the message and checks if the catalog ID belongs to an existing catalog. If it exists, new item information is used to update the local database. If the catalog ID is new, the old catalog is deleted and items from the new catalog are added to the database.

UC002 Request Price Quote and Availability

Description

This use case provides an automated process for trading partners to request and provide product price and availability.

Actors

1. Buyer organization (referred here as buyer)
2. Seller organization (referred here as seller)

Main Flow

The buyer composes a price quote and availability request message. The message contains the following information:

- The buyer's business ID (DUNS number)
- For each requested item, the following information is provided:
 - The product Stock Keeping Unit (SKU) number.
 - Quantity of the product requested.

The buyer sends the request to the seller and waits for a response. The seller receives the request. The seller composes a reply message. In this message, for each requested item, the following information is provided:

- The product Stock Keeping Unit (SKU) number.
- If the requested quantity is available (yes/no).
- Available quantity
- Supply date
- Quote ID
- Price

UC003 Request Shopping Cart Transfer

Description

This process provides a automated process to transfer the contents of a shopping cart to the seller to place an order. This use case corresponds to placing the actual order between the buyer and seller.

Actors

1. Buyer. Note: The term "Buyer" covers an employee or a software system from the buyer organization. The later indicates automated order placement.
2. Seller

Main Flow

The buyer prepares a shopping cart containing items that need to be ordered. The buyer requests a shopping cart transfer (placement of order). The buyer system may at this point choose the appropriate seller organization for each item based on price quote and availability (UC002).

For each selected seller organization, system prepares a message as follows.

- The buyer's business ID (DUNS number)
- Shipping address
- Ship mode
- For each item available from the seller
 1. The product Stock Keeping Unit (SKU) number
 2. Requested Quantity

The Seller confirms the order and provides the following information for record keeping

- An order reference number
- Grand total cost of order
- Cost of shipping
- Cost of products
- Tax on shipping
- Tax on products
- For each product ordered
 1. The product Stock Keeping Unit (SKU) number
 2. Order Quantity
 3. Price
 4. Approximate delivery date

UC004 Query Order Status

Description

This use case allows a buyer to query for the current status of an order that was placed using UC004.

Actors

1. Buyer organization (referred here as buyer)
2. Seller organization (referred here as seller)

Main Flow

The buyer prepares a order status query message that contains the following information.

- The buyer's business ID (DUNS number)
- Order Number

The message is sent to the seller. The seller analyzes the message and prepares a response message. The response contains the following information.

- Order Number
- Over all order status. For example, shipped or partially shipped.
- For each item ordered
 1. The product Stock Keeping Unit (SKU) number
 2. Status
 3. Shipment date (if shipped)
 4. Tracking number (if shipped)

EVALUATION ONLY

Lab 3 - Build Preliminary Business Processes

What this exercise is about

After the business use cases have been defined, you will need to start designing the business processes. A business process is designed visually like a flow chart. It shows the sequence of activities and alternate flow paths.

We should distinguish such a preliminary business process from an actual executable business process. The former is usually created by the business analysts. The latter is created by the developers. A good tool will help the analysts export the business process as a BPEL document that the developers can import into the development tool.

A business process diagram helps the analysts visualize the process and fine tune it for cost and time. Once the diagram is handed over to the developers, they can proceed with the service identification phase.

In a business to business interaction scenario, there are typically two separate business processes that make up a use case. For example, for UC001 Propagate Product Catalog, the initiator business process runs in the seller organization. The business process sends a catalog message to the buyer. At this point, the participant business process begins to run in the buyer organization. This participant business process is responsible for saving the catalog data.

Initiator business processes are usually started due to certain user interaction with a GUI screen (such as a web page). The participant processes are usually started by the initiator processes.

What you will be able to do

- Draw initiator and participant business process diagrams from use cases.

Part 1 - Create a Business Integration Module

A business integration module (or just module) is an unit of deployment for the Service Component Architecture (SCA) programming model. It is analogous to the Enterprise Application (or EAR) for the J2EE programming model. All SCA artifacts, such as business processes are created in a module.

Behind the scene, a module is made up of:

- A Java project of the same name as the module.
- A J2EE Enterprise Application project.
- An Enterprise JavaBean (EJB) project.
- A Java project containing EJB client runtime code (such as home and remote interfaces).
- A Web project.

__1. Open Integration Developer by clicking on **Start --> All Programs --> IBM --> Integration Designer --> IBM Integration Designer 8.0.**

__2. Change the the workspace folder **C:\workspace** and click **OK.**

__3. **IBM Integration Designer 8.0** will open.

IBM Integration Designer 8.0

Integrated IBM Products

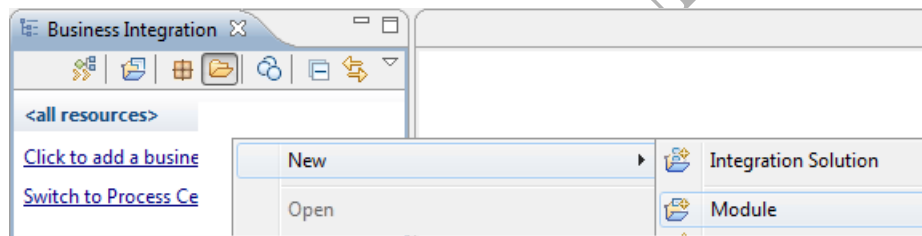
IBM Business Monitor Development Toolkit 8.0

IBM Integration Designer 8.0

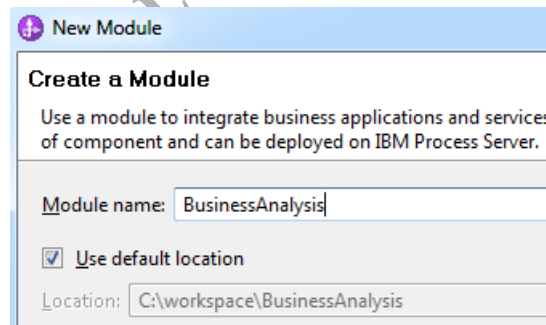
__4. Close the *Getting Started* page.

__5. Business Integration perspective will be open by default. If this perspective is not opened then from the menubar select **Window->Open Perspective->Business Integration.**

__6. Right click on the **Business Integration** view and select **New->Module.**

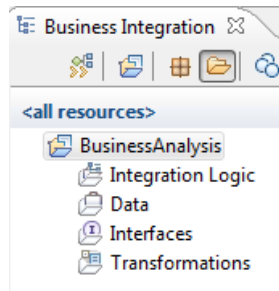


__7. Enter **BusinessAnalysis** as the module name.



__8. Click **Finish.**

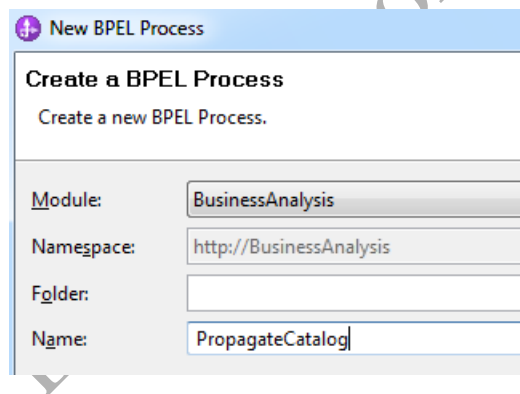
After a moment the Module will be created.



Part 2 - Develop the UC001 Initiator Process

In this step, we will build the preliminary process diagram for the initiator business process for use case UC001 Propagate Product Catalog. The step will contain detail instructions. You should be able to build the process for the remaining use cases without aid.

1. Right click **BusinessAnalysis** and select **New->BPEL Process**.
2. Enter **PropagateCatalog** as the process name.



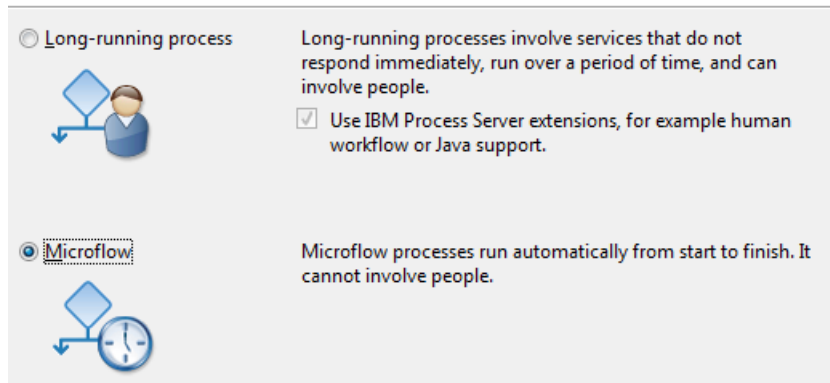
3. Click **Next**.

__4. Select **Microflow**.

BPEL Process Type Selection

Select whether the process should be of type long-running or microflow.

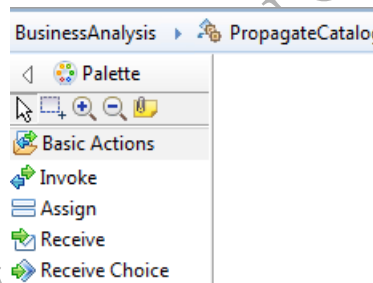
<input type="radio"/> Long-running process	Long-running processes involve services that do not respond immediately, run over a period of time, and can involve people.
<input checked="" type="radio"/> Microflow	Microflow processes run automatically from start to finish. It cannot involve people.



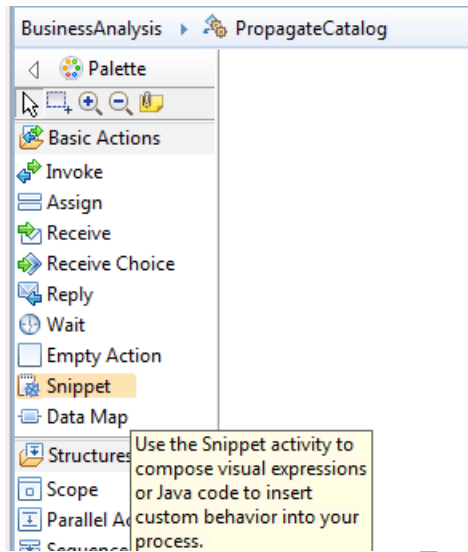
__5. Click **Finish**.

This business process will run in the sellers system. The seller needs to compose a new catalog message and then send it to the buyer.

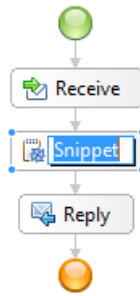
__6. At the left the *Palette* should be opened and expanded.



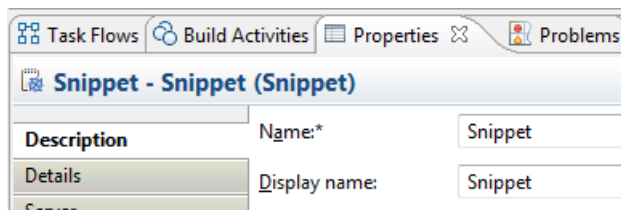
__7. Click on **Snippet** activity. A snippet activity contains small amounts of Java code that runs as a part of the process.



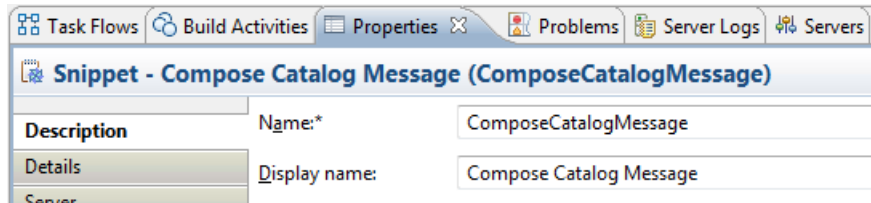
__8. Click below the **Receive** activity to add it.



__9. Select the **Properties** tab.



__10. Change both the name and display name of the snippet activity to **Compose Catalog Message**

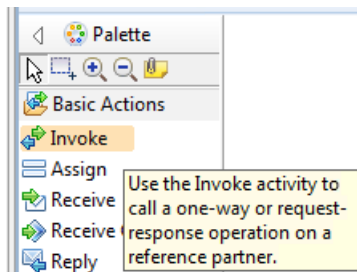


Notes:

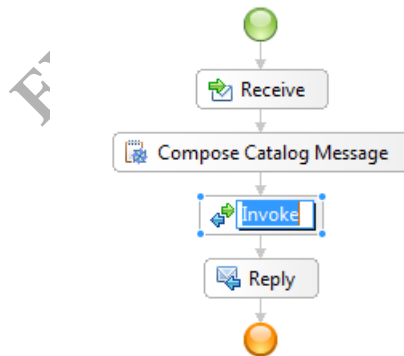
Spaces in the name will be removed when you move out of the field box.

Every time you are requested to change the name is a good practice to change both, if you only change the display name you can have conflicts.

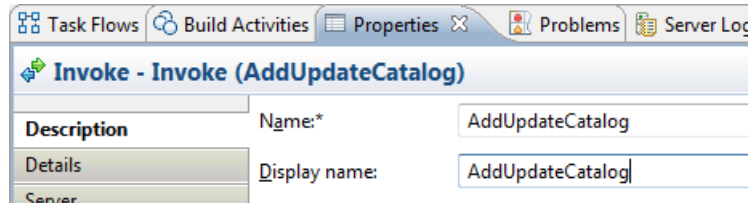
__11. From the *Palette* select the **Invoke** activity (second from top). An invoke activity is used to invoke an operation of an external service. In our case, we will need to invoke an operation of the buyer's service to propagate the catalog.



__12. Click below the **Compose Catalog Message** snippet activity to add it.

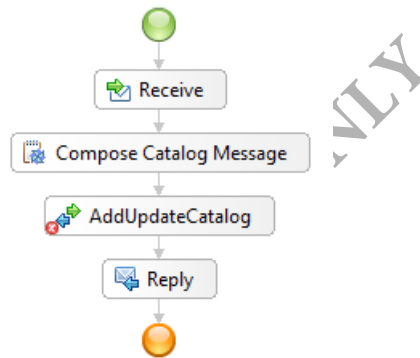


__13. In *Properties* of the newly created Invoke activity change the name and display name to **AddUpdateCatalog**



Note: It is a good idea to name an invoke activity as a verb. During the service identification phase, these invoke activities directly translate to service operations.

__14. Save changes (Control+S). IID 8 will show an error message using a red icon next to the invoke activity. Ignore that.



Part 3 - Develop the UC001 Participant Process

Usually, a different organization designs and executes a participant process than the initiator process. For simplicity's sake, we will develop the participant process in the same module as the initiator.

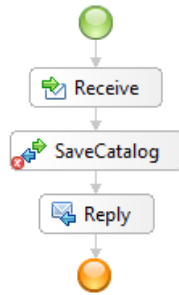
__1. Create another **BPEL Process** selecting *Microflow* type as you did it before and call the process as **AddUpdateCatalog**

This business process will run in the buyer's side.

__2. Add a new *Invoke* activity below the *Receive* activity.

__3. Change its name and display name to **SaveCatalog**

__4. Save changes.



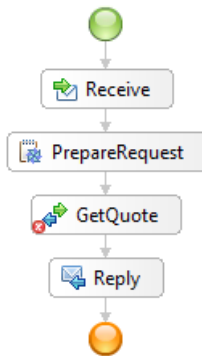
Note: in real life, there may be more processing involved.

Part 4 - Business Process Solutions

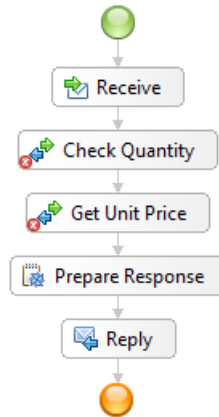
__1. Following the same steps that you just learned create the initiator and participant BPEL processes for the remaining use cases, remember selecting the *Microflow* type.

The BPEL processes solutions are provided as follows:

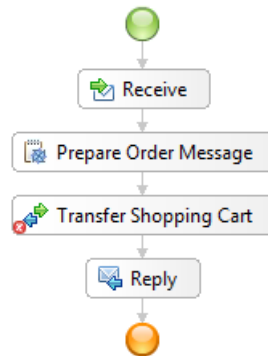
RequestQuote – The initiator process for UC002 Price Quote and Availability. This process runs in the buyer side.



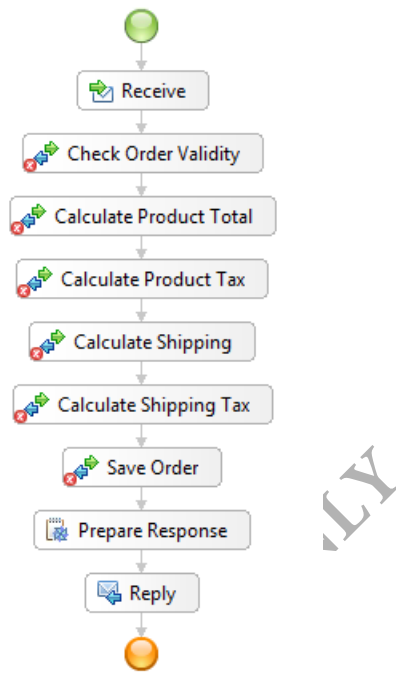
PriceQuote – The participant process for UC002 Price Quote and Availability. This process runs in the seller side and begins to run when the GetQuote activity of the initiator process is executed. **Note:** You will fully implement this business process over the next few labs.



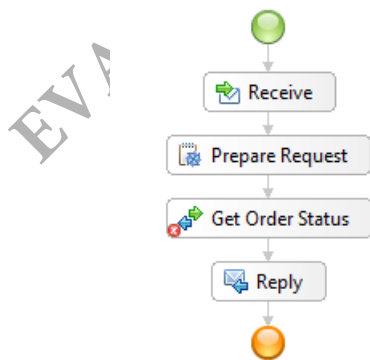
PlaceOrder – The initiator process for UC003 Request Shopping Cart Transfer. This process runs on the buyer side when the user confirms an order placement. Note, this process allows the buyer organization to do some pre-processing before the order is actually placed with the seller.



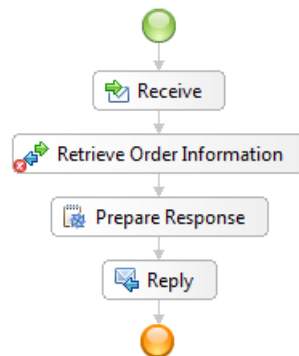
AcceptOrder – The participant process for UC003 Request Shopping Cart Transfer. This process runs in the seller side. It begins to run when the "Transfer Shopping Cart" activity of the initiator process is executed.



QueryOrderStatus – The initiator process for UC004 Query Order Status. This process runs in the buyer side.

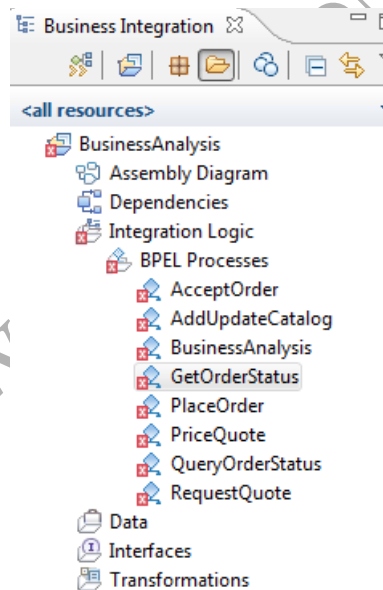


GetOrderStatus - The participant process for UC004 Query Order Status. This process runs in the seller side. It begins to run when the "Get Order Status" activity is executed in the seller side.



__2. Make sure all the BPEL Processes are saved.

__3. All you processes will be shown under *Integration Logic*. All processes have errors at this point, this is fine for now because we don't have any implementation yet.



__4. From the menu, select **File** → **Close All**.