ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ

Εισαγωγή στα Δίκτυα Υπηρεσιών

Διάλεξη 5η: Assisting Lecture 2 - IBM Modeler

Μύρων Παπαδάκης

Τμήμα Επιστήμης Υπολογιστών

Introduction to Service Networks
CS-592 – Spring 2015

Assisting Lecture 3

SNAPT (Service Network Analysis & Prediction Tool)

Myron Papadakis (myrpap@gmail.com)

Introduction to SNAPT

- SNAPT
  - A tool that models and analyzes Service Networks
  - Facilitates the creation of Abstract Business Processes based on Service Networks

- Service Networks (Systems)
  - Model Services that are offered and consumed by Business Entities
  - Everything is a service or a Service Provider!
  - High level of abstraction
  - **Target Group: Business Analysts, System Analysts and Designers**

SNAPT Meta-model

- Service Network
  - a set of **business entities** and **services** depicted as a graph:
    - **nodes** corresponding to the participating **business entities**
    - **edges** corresponding to **services**.
      - **services** refer to both goods and services, *tangible* and *intangible* in nature, and denote what is exchanged in the context of service network model

- An **arc** implies an **economic exchange:**
  - the origin point is the business entity which offers the service
  - the end point refers to the business entity that consumes the offered service

SNAPT > Business Entity

- **Business entity** : any independent economic entity that provides and/or consumes services in a service network., cooperating with a lots of independent business entities

- Only those services that contribute to the final service offering are modeled for each business entity.

- Business entities generate **value** from their participation in the network, so they have **costs** and **revenues** that derive from the services they offer or consume in the network.

- Each business entity is assigned with one **role** in a particular service network (depends purely to what services it offers)
    - e.g “Ford” is a Business Entity with the role of being “car manufacturer”.

SNAPT > Business Entity > Types (1/2)

- **End-customers**
  - business entities that do not offer any service, just consume them
  - they are not a business partner and they do not contribute to the service composition.
  - they offer a service by providing feedback on their experiences

- **Enablers**
  - special type of business entities that offer services that *enable the delivery of other services.*
  - Example: FedEx, intermediate payment services like Paypal or Google Checkout can be considered as “enablers” in a service network model

SNAPT > Business Entity > Types (2/2)

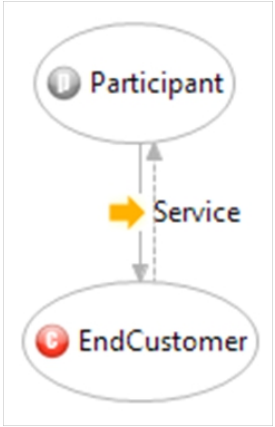
- **Service Sub-networks**
  - business entities that have an *internal structure of their own*
  - nestle an entire service network that provides and/or consumes services.
  - restriction: each service offered or consumed by a service sub-Network must also be offered or consumed by a single Business Entity inside the Sub-Network.
  - can be used to analyze the internal structure of an organization.

- **Participant**
  - an ad-hoc business entity in the network, which is not service sub-network, end-customer or enabler

SNAPT > Visualize Service Networks (1/2)

- **A service always connects two business entities** indicating that a business entity offers a service to another business entity which consumes it

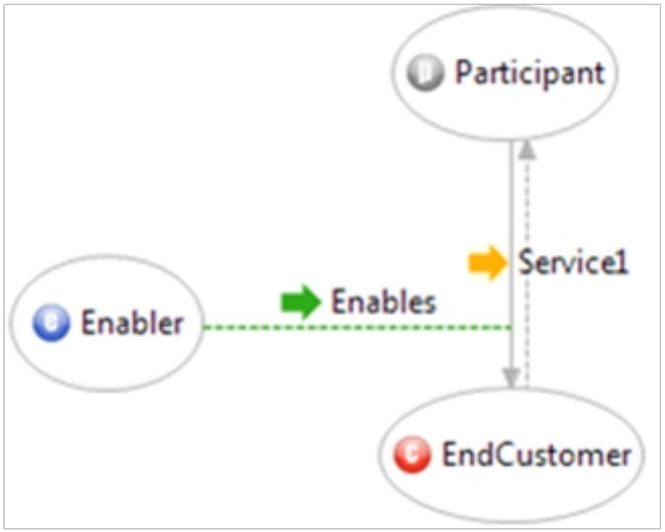
- Services connect business entities with 1-to-1 relationships:
  - **service offer**: represented with a **solid-line arc**
  - **service consumption**: depicted as a **dashed-line arc**



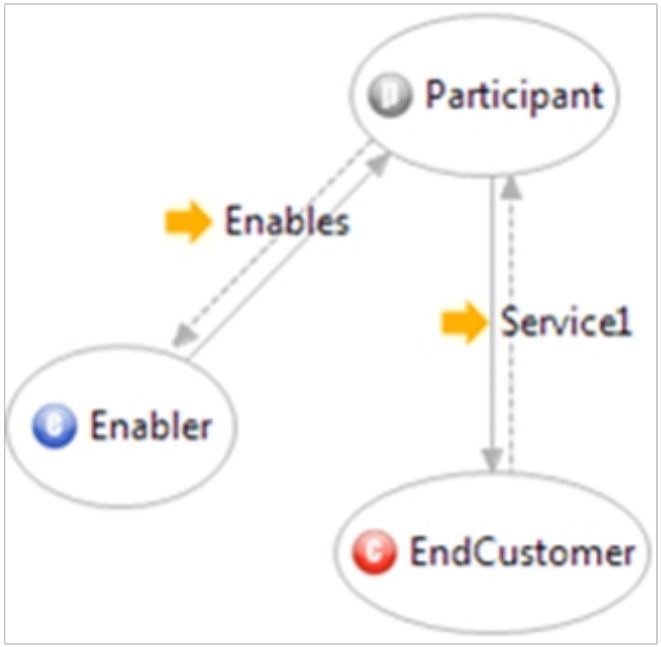
Participant offers a Single service to the EndCustomer

SNAPT > Visualize Service Networks (2/2)

- **Enablement**: connects an enabler with another business entity or directly with the service it enables during the visualization process.

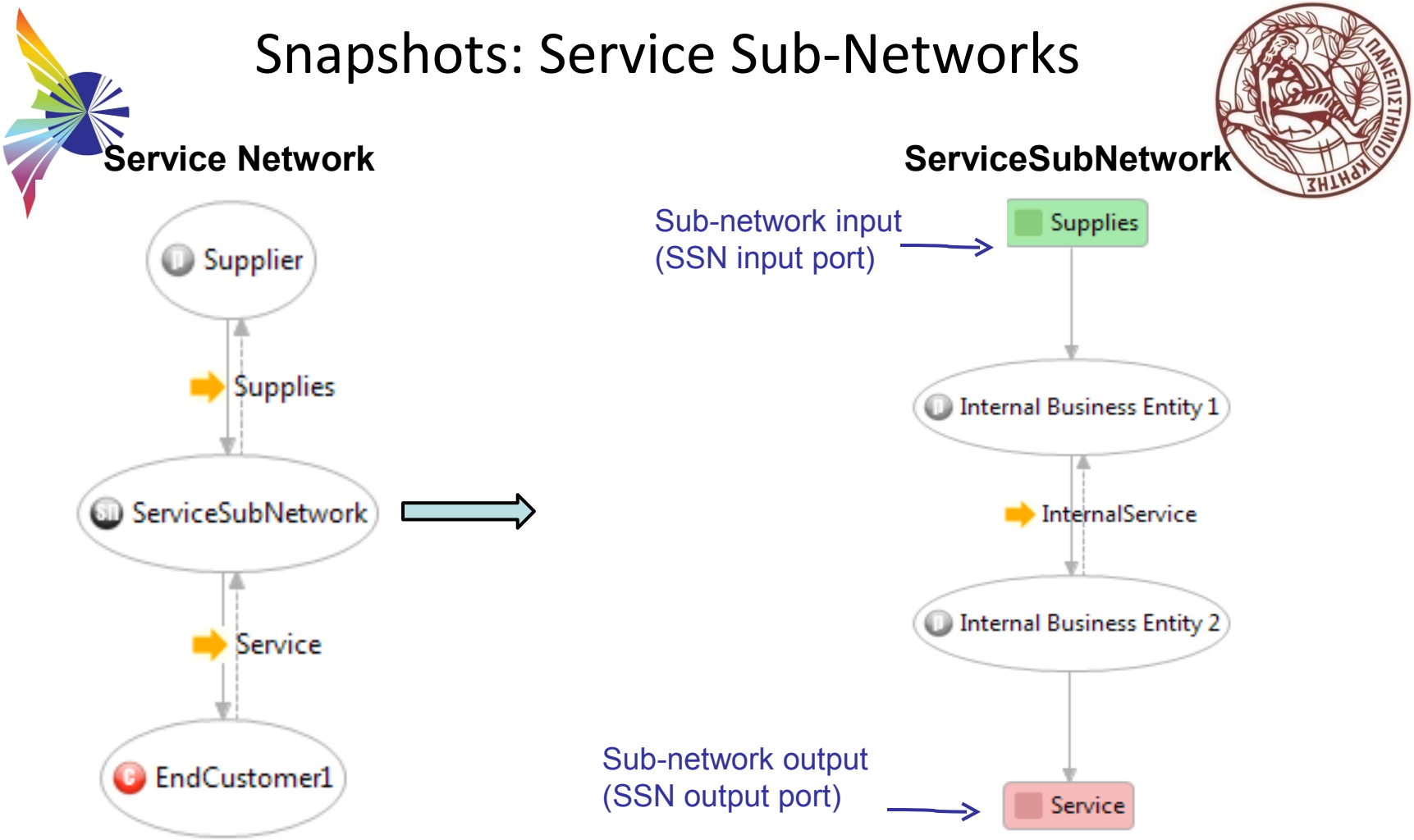


OR



Enablement Service: an Enabler enables the delivery of the Service 1

Snapshots: Service Sub-Networks



Service "*Supplies*" consumed by ServiceSubNetwork in the SN (left), is mapped to an input port in the ServiceSubNetwork (right).

"Service" offered by ServiceSubNetwork in the Service Network (left), is mapped to an output port in the ServiceSubNetwork (right).

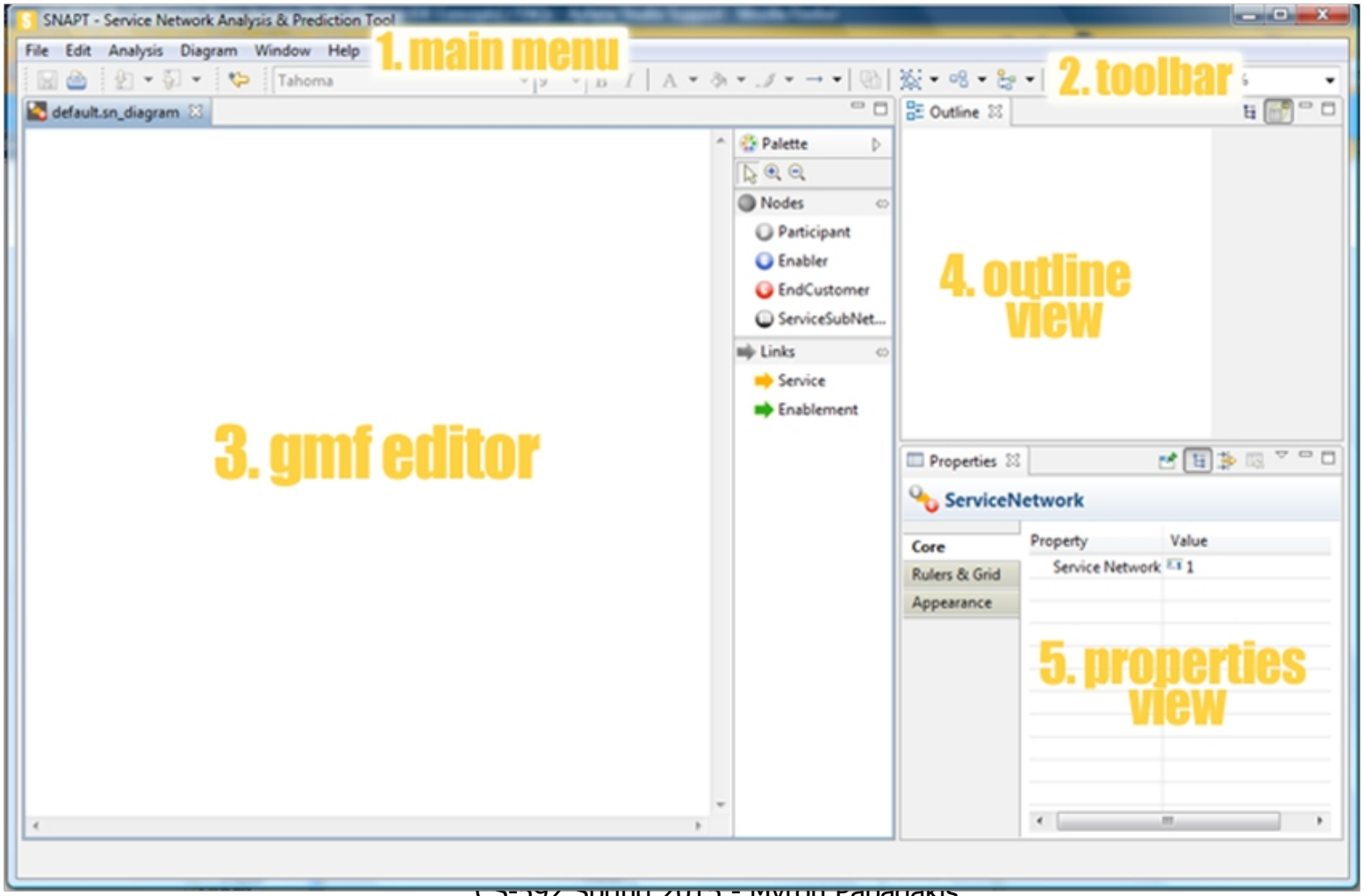
SNAPT > Costs and Revenues

- **Services** are associated with **costs** and **revenues**.
  - Each service delivery generates revenues.
    - **Service revenues are costs for the service consumer and revenues for the service provider**
  - A “service offer” indicates that target service’s revenues should be added to the source business entity’s total revenues.
  - Services can be intangible in nature (advice, knowledge); in this case, the revenues are assumed to be equal to zero.
- The profit of any Business Entity is calculated as follows:

  Profit = Σ(IncomingServiceRevenue) – Σ(OutgoingServiceCost),

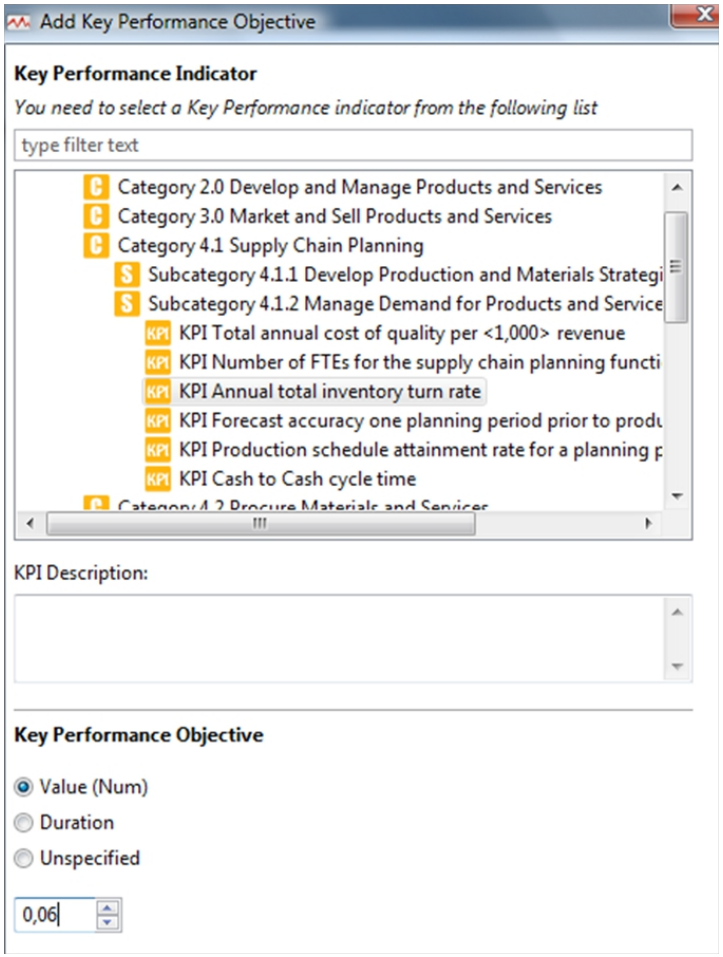
  where *IncomingServiceRevenue* and *OutgoingServiceRevenue* refer to the revenues deriving from the business entity’s consumed and offered services respectively.

SNAPT > Start of the Program



SNAPT > Snapshot: Assign KPOs

- SNAPT provides a KPI Library based on the APQC Process Classification Frameworks
  - Fully compatible with IBM Websphere Business Modeler
- SNAPT updates its internal KPI library from the KPIs Repository
  - REST-based interface
- SNAPT user can select from the library the desired KPO to assign to a service
- A KPO describes the targeted value, i.e. a target performance value, and a KPI indicates the actual measured value



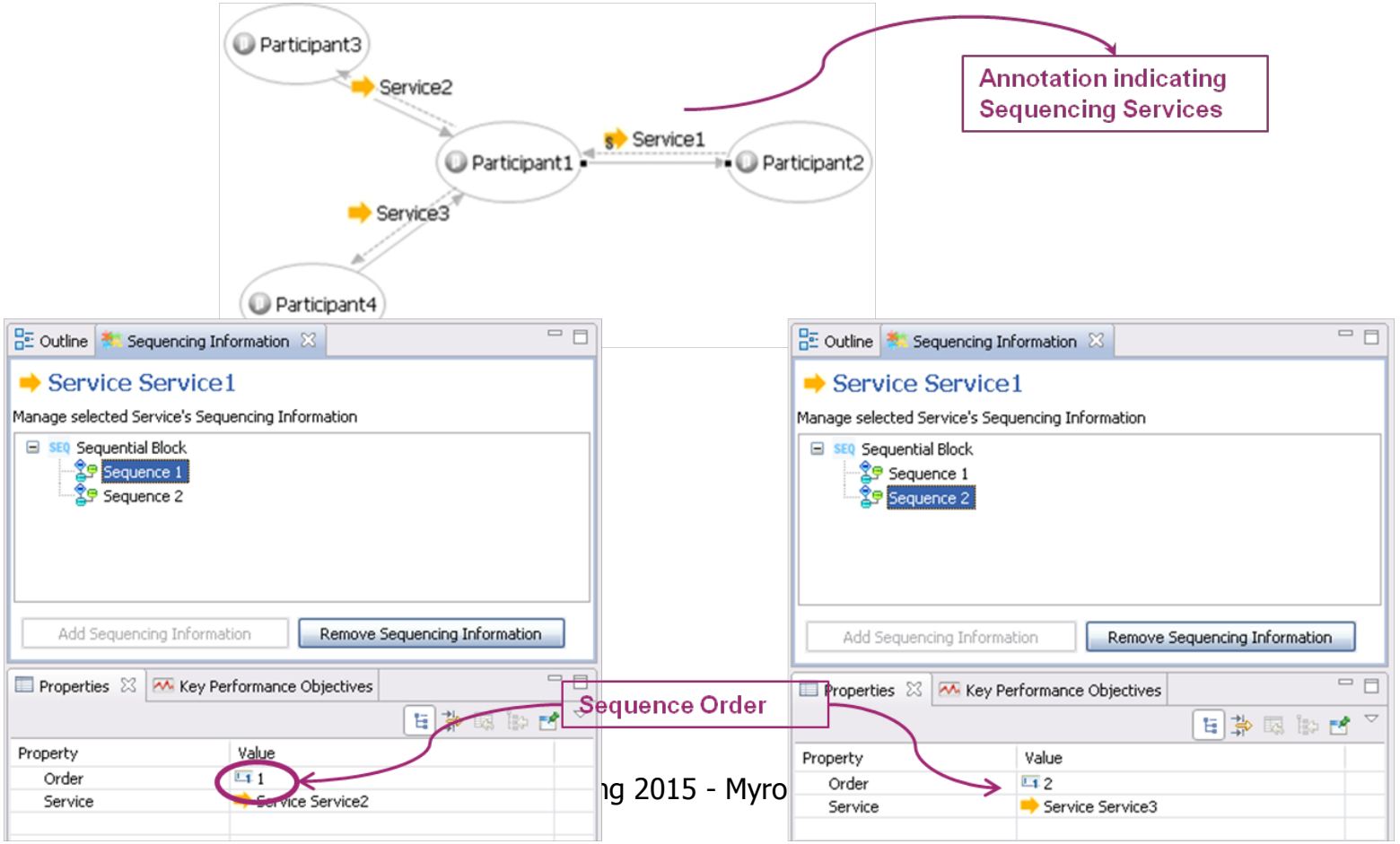
SNAPT > Sequencing of Services (1/4)

- It is mandatory to properly annotate services in the service network models to **define the order of services** in a service network model
- Sequencing information of each service S is created relatively to the set of services that are offered to the source business Entity of service S
- **Gateways are used to express sequencing**, which can be nested in any order
  - **Sequential Block**: this gateway implies that any of its children elements is delivered in series, one after the other
  - **AND Block**: this gateway specifies that its elements should be delivered in parallel
  - **XOR Block**: denotes that exclusively one of the elements in the block must be delivered.

- Any sequencing service (a service with sequencing information attached) is decomposed to several services that will be delivered in the order defined by gateways

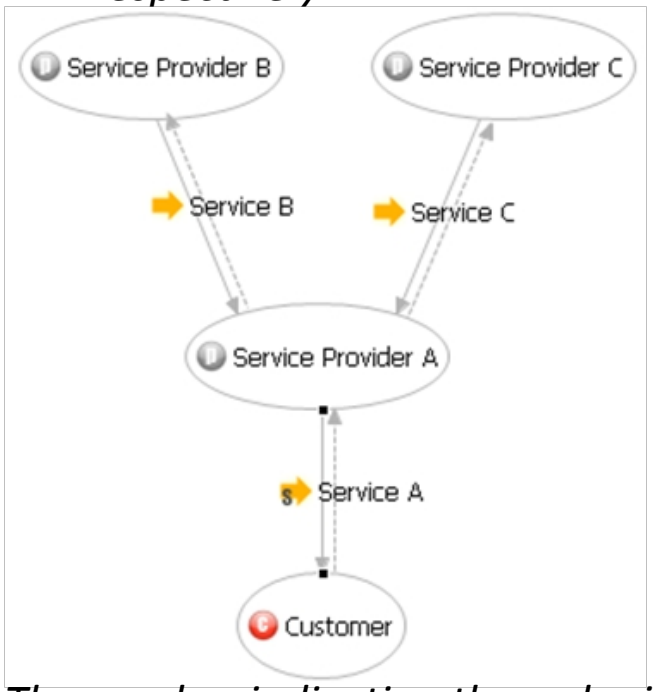
SNAPT > Sequencing of Services (2/4) > Simple Sequential Block Example

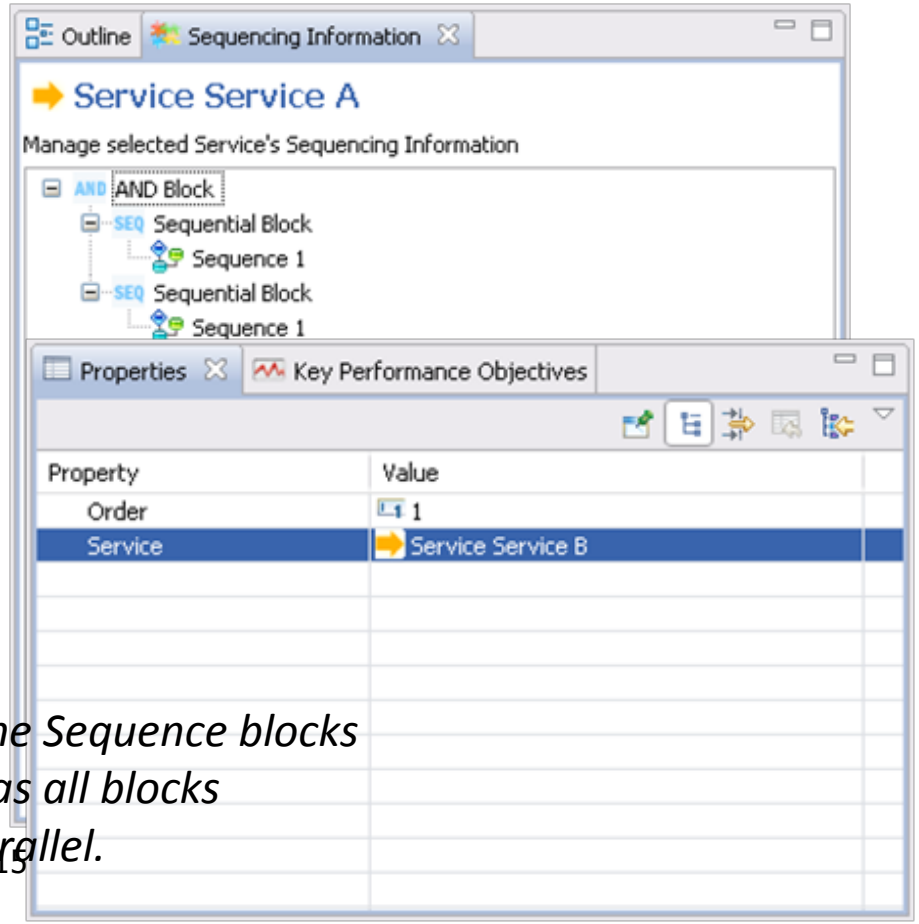
- **Example of Sequential Block**: *In order for Service1 to be delivered to Participant2, **both** Service2 and Service3 must first be delivered to Participant1 in order.*



SNAPT > Sequencing of Services (3/4) > AND Sequential Block Example

- *In order for the service provider A to deliver service A, he must consume in **parallel**, both service B and service C offered by service provider B and service provider C, respectively.*

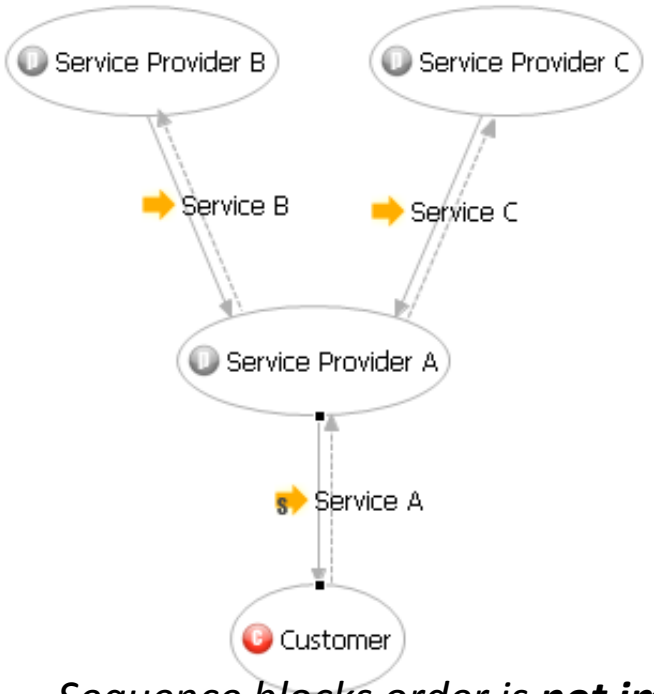


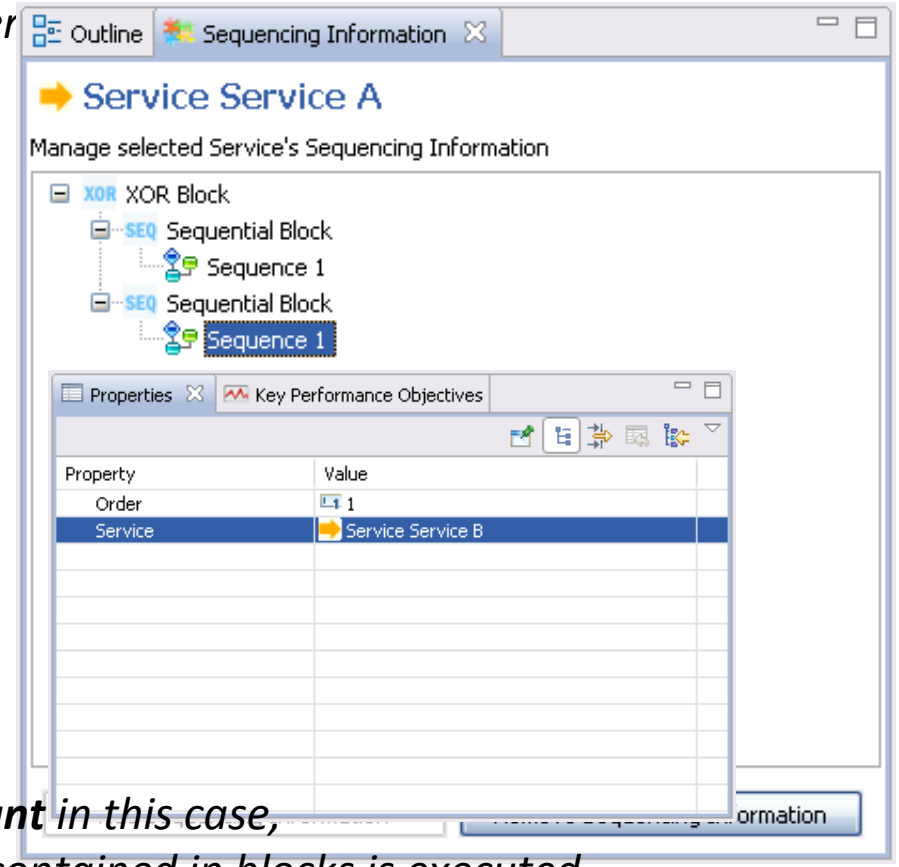


*The number indicating the order in which the Sequence blocks are executed is **not important** in this case, as all blocks contained in AND blocks are executed in parallel.*

SNAPT > Sequencing of Services (4/4) > XOR Sequential Block Example

- In order for the service provider A to deliver service A, he must consume ***either*** service B ***or*** service C offered by ser respectively.

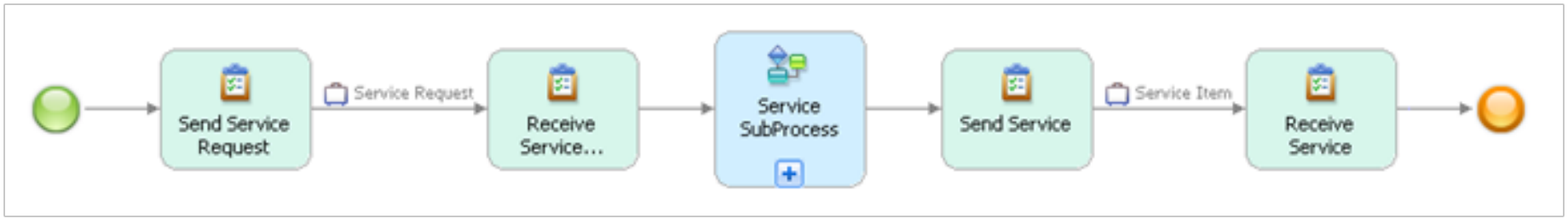




*Sequence blocks order is **not important** in this case, as exclusively only one of the blocks contained in blocks is executed*

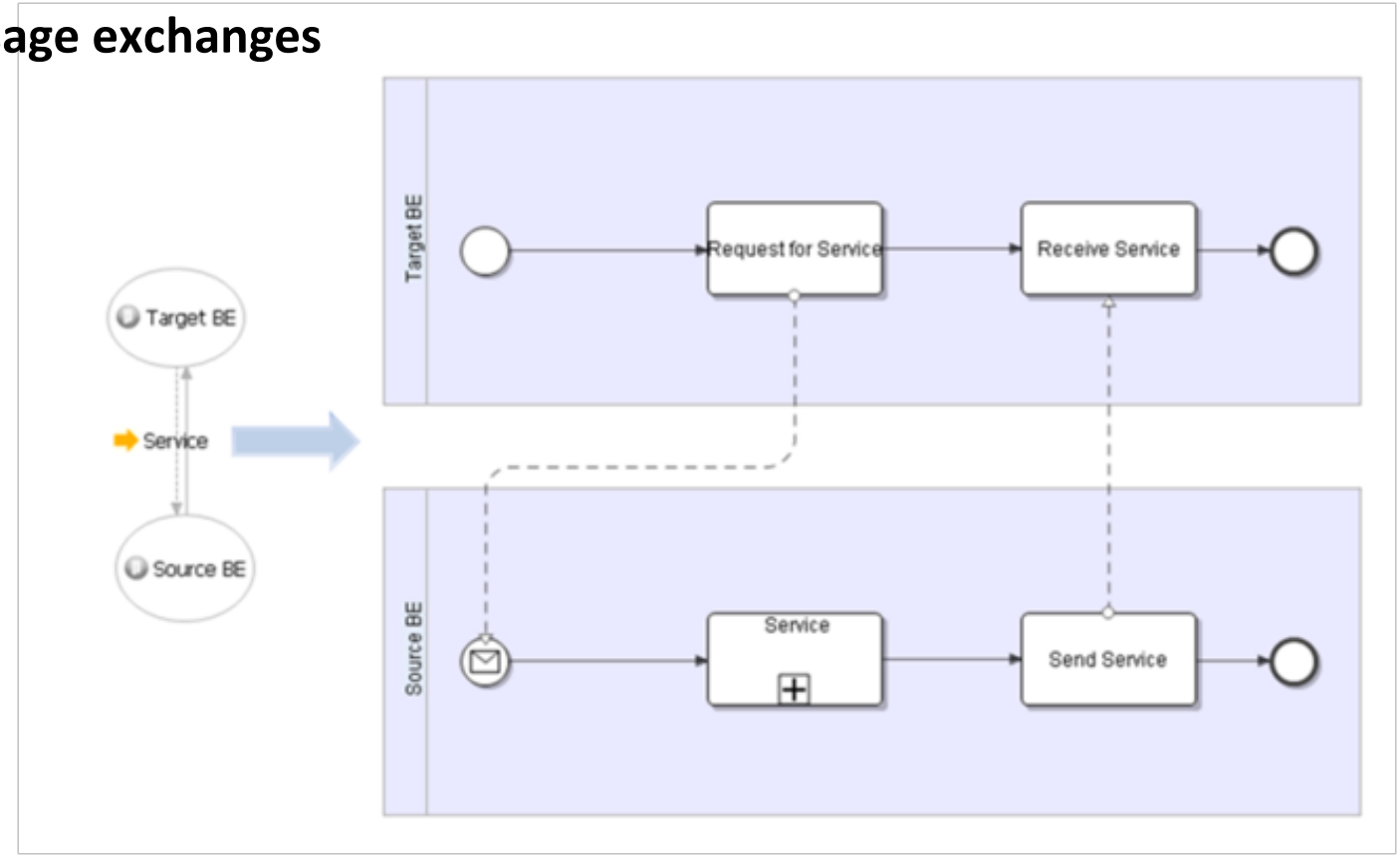
From Service Networks to draft Business Process Models > IBM WBI Modeler

- **For each service** with no sequencing information defined for it, a **generic process flow** is created containing the following:
  - two **business items** named “Service request” and Service Item”, which correspond to the data flows;
  - a **sub-process** corresponding to the Service assigned to the source business entity organization unit;
  - **two tasks** assigned to the organization unit of the target business entity **that starts and ends the process**;
  - **two additional tasks** for the source business entity for receiving the request, process the Service and send the response back

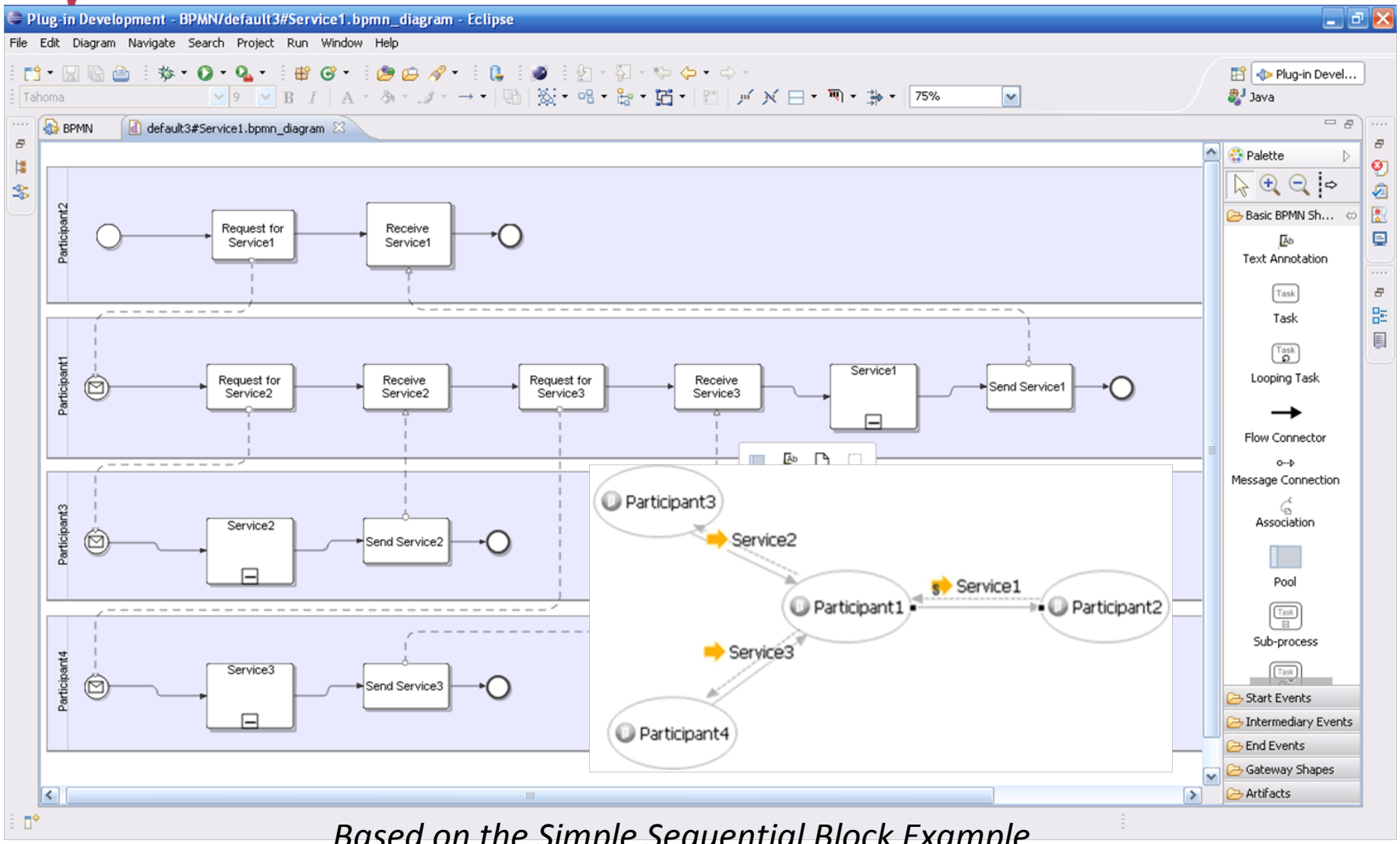


SNAPT > From SNAPT to Eclipse BMPN Editor

For each service with no sequencing information defined for it, a new BPMN diagram is created depicting a generic workflow consisting of the two **pools**, corresponding to the source and target business entity, connected with **message exchanges**



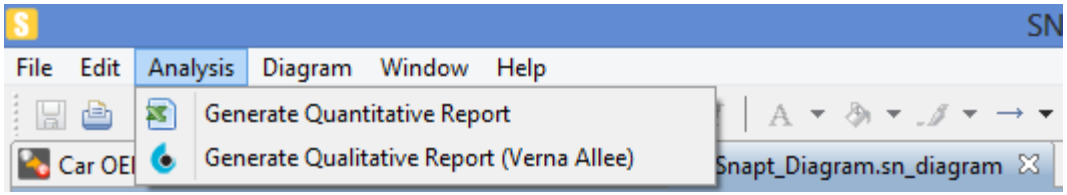
SNAPT > From SNAPT to Eclipse BMPN Editor > Example



Based on the Simple Sequential Block Example

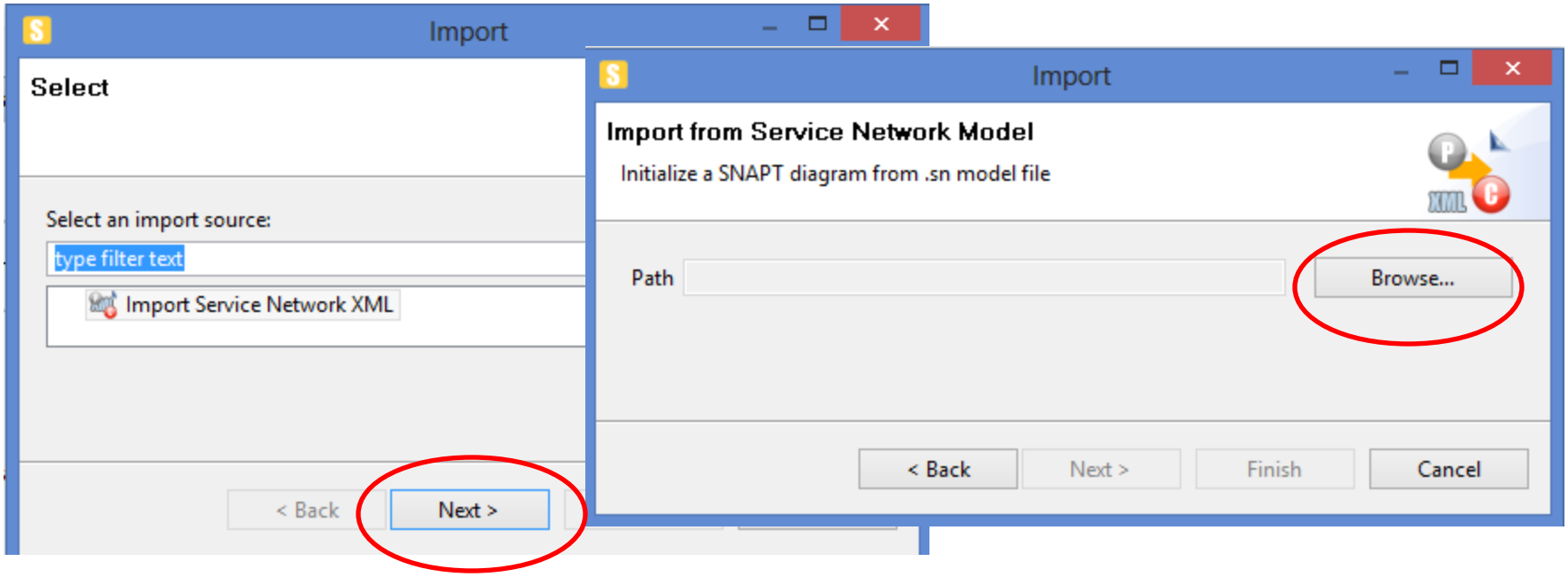
SNAPT > Generating Profitability Sheets

- SNAPT allows the generation of profitability sheets from a service network model (**Excel worksheets**).
- These worksheets provide an overview of the **cost-revenue** calculations within the service network.
  - Separate excel sheets are generated to display each business entity's costs and revenues;
  - an additional (first) sheet is also used to summarize the costs / revenues for the entire network.
- Of course we have to assign the corresponding costs/revenues to the services (see Slide: "SNAPT > Assigning Costs")
- Select "**Analysis→Generate Quantitative Report**" from the Main Menu.



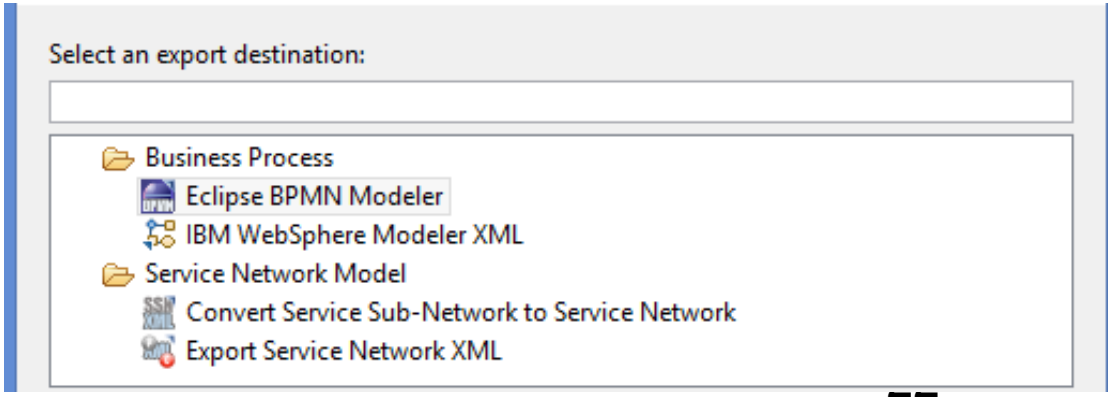
SNAPT > Import

- Wizard for importing service network semantic model files (XML file) and automatically initializes a diagram to represent them on the canvas.
- To import a service network xml file, select "**File**"→"**Import**" from the Main Menu.



SNAPT > Export

- Two options regarding whether we deal with **business processes** or **service networks**.
  - **Service network models**
    a) export a service network model into an XML format
    b) convert a service sub-network into a service network.
  - **Business processes**
    a) business process models compatible with the *Eclipse BPMN Modeler*
    b) business process models compatible with *IBM WebSphere Modeler* (XML format)



Amazon Example

- Model a simplified Amazon's service network that delivers the final service of selling books to the end customers.
- **Amazon** cooperates with a **storehouse** to provide it with books
- Amazon is a cooperation with many departments dealing with customer orders, accounting etc.
- Amazon's **own store department is responsible for processing and packaging a customer's order**
- Assume that the **Accounting department** inspects the packages, prints the invoice and finally **deals with FedEx** to ship the order.

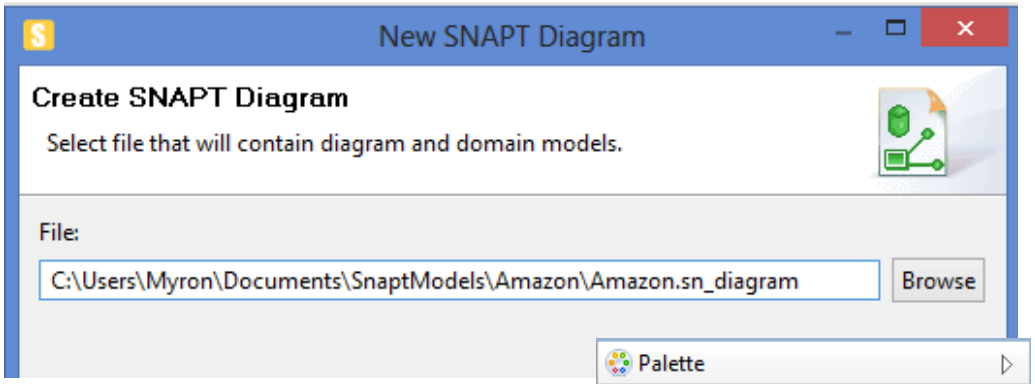
Preliminaries

- Think which business entities your service network will include:
  - Can you identify the participants, enablers, and the end customer?
  - Are there any sub-networks?

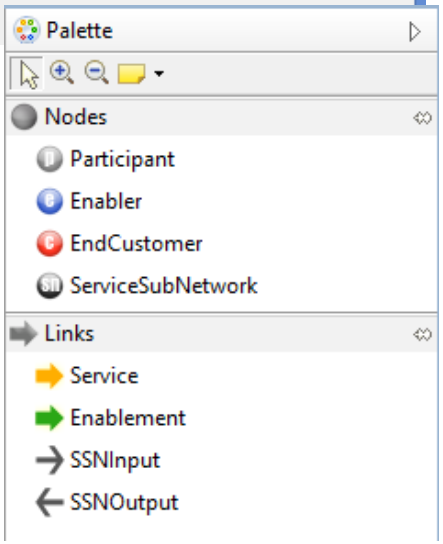
- Note that we are mostly interested in Amazon's service network

SNAPT > Create a new diagram

- Firstly, create a new snapt diagram, i.e “Amazon.**sn_diagram**”



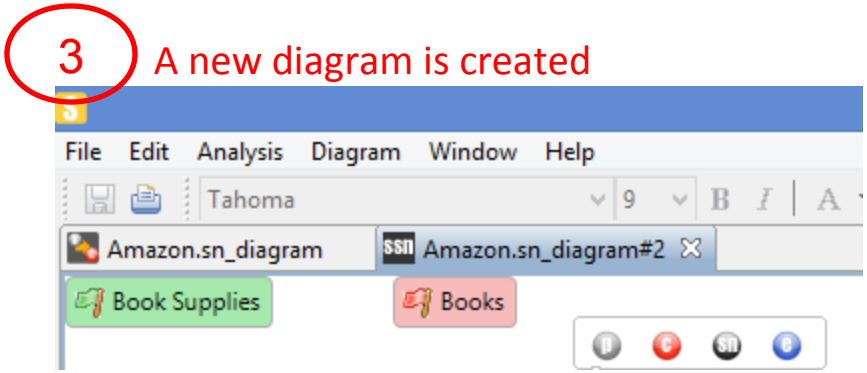
- Then start modeling by selecting the appropriate business entities from the palette.

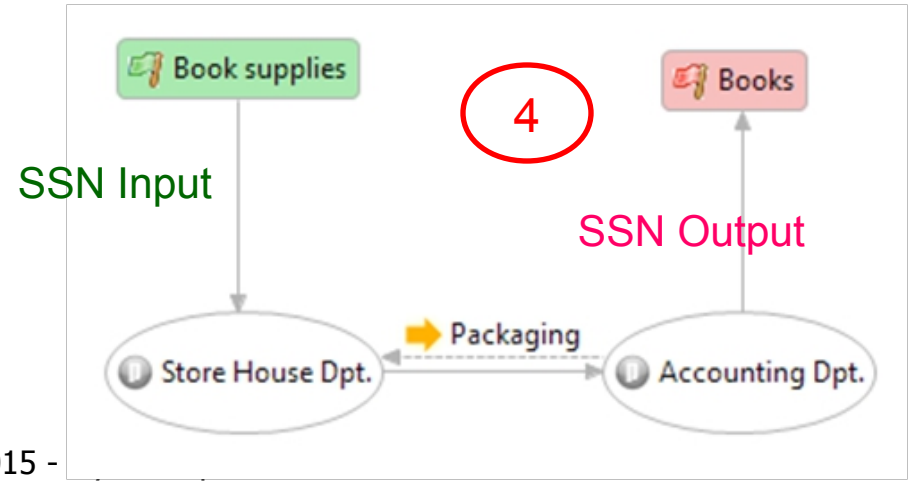


SNAPT > Create a service Sub-Network

- Note that Amazon is a Service Sub-Network (you must have 2 diagrams)

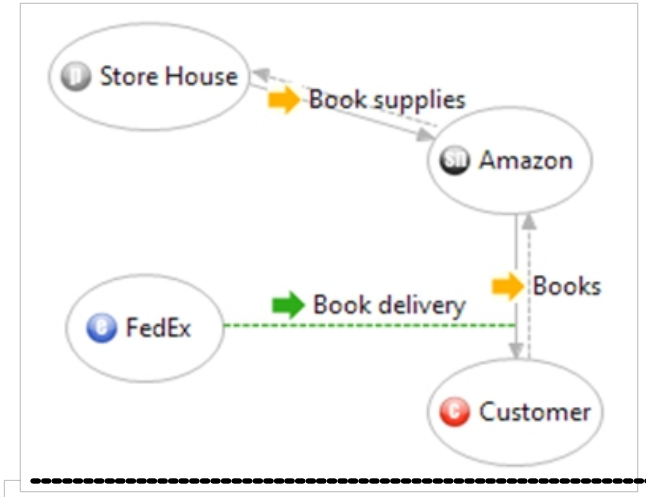
Double click the service sub-network and then model it

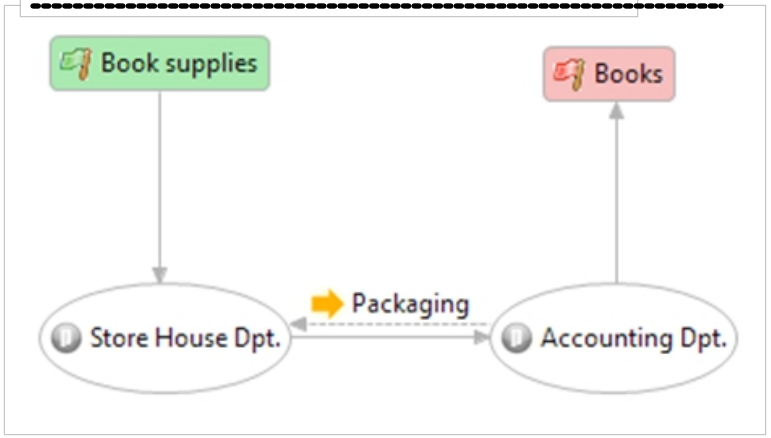




Export > Converting a Service Sub-network to a Service Network

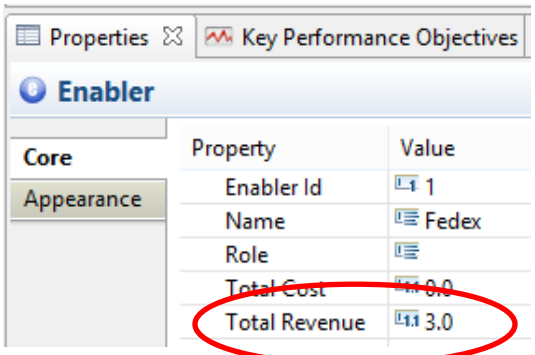
- Export a service sub-network as a standalone service network
- Select "**File→Export → Convert Service Sub-network to Service Network**"

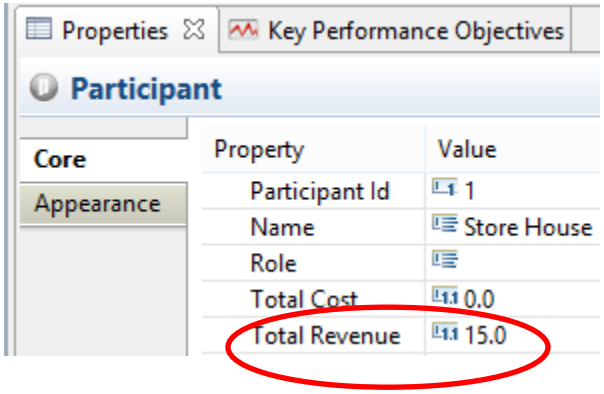


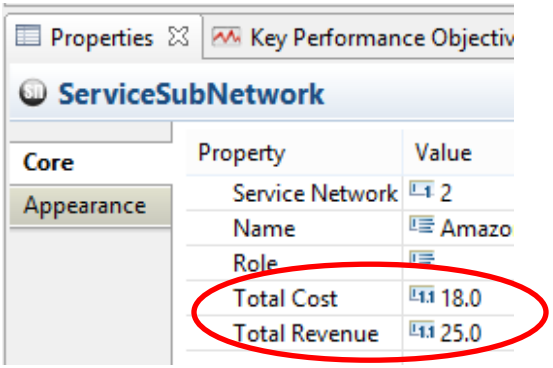


SNAPT > Assigning Costs

- Assume that the Store House charges 15 € for its service and Fedex charges 3€ for the delivery service. Hence, Amazon's cost is 18 €
- Amazon sells the book for 23 €
- Consequently the total profit of Amazon is 23 – (15+3) = 5 €
- Some snapshots shown below…



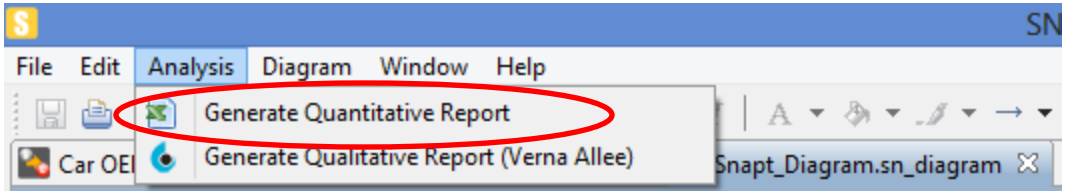




SNAPT > Generate a quantitative report

Profit = Σ(IncomingServiceRevenue) – Σ(OutgoingServiceCost)

Now export generate a quantitative report (an excel file will be created) and check it



Example 2 > Description

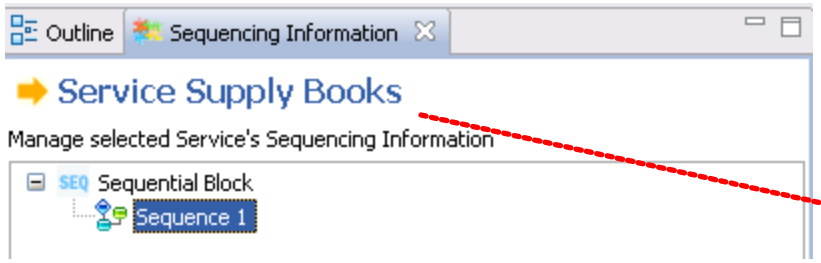
- Amazon Printing Press prints the books and provides them to a Book WareHouse
- The Book WareHouse supplies the books to the Amazon
- A Web Hosting Provider hosts the Amazon website and supports it
- Amazon sells the books to the end customer
- Objectives
  - Create the service network
  - Add sequencing information
  - Export to IBM WBI Modeler

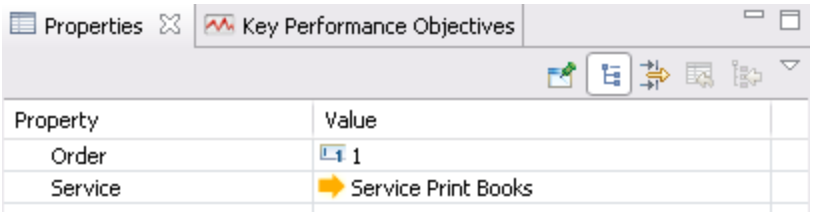
Example 2 > Modeling

- Create a new SNAPT project
- The Book Warehouse must consume the *Print Books* service offered by the Amazon Printing Press in order to provide the *Supply Books* service.
- Amazon needs to consume both
  - the *Supply Books* service offered by the Book Warehouse and
  - the *Website Host & Support* service offered by the Web Hosting Provider

Example 2: Adding Sequencing Information (1/2)

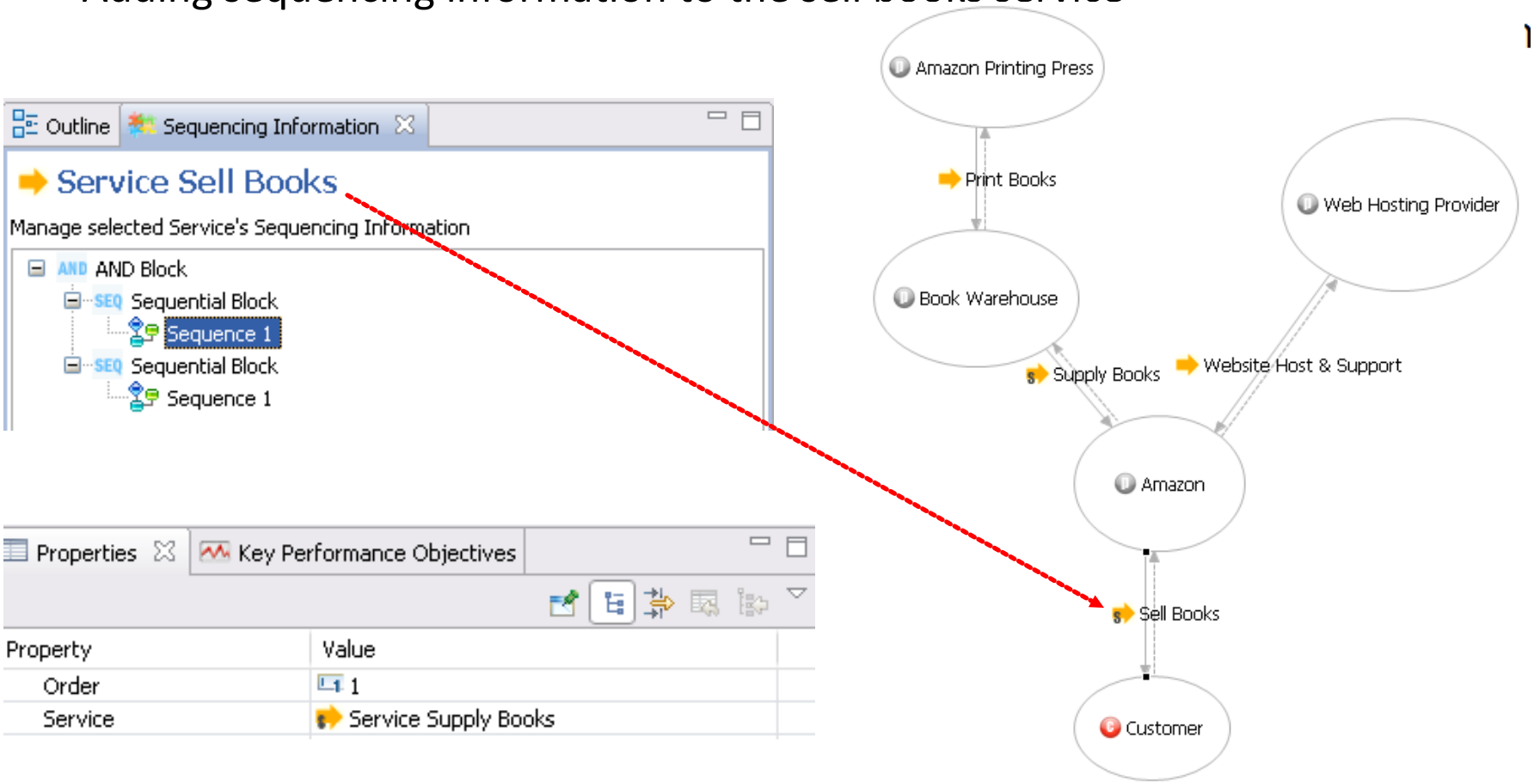
- In order for the supply books service to be provided to the Amazon, the books must be printed from the Amazon Printing Press



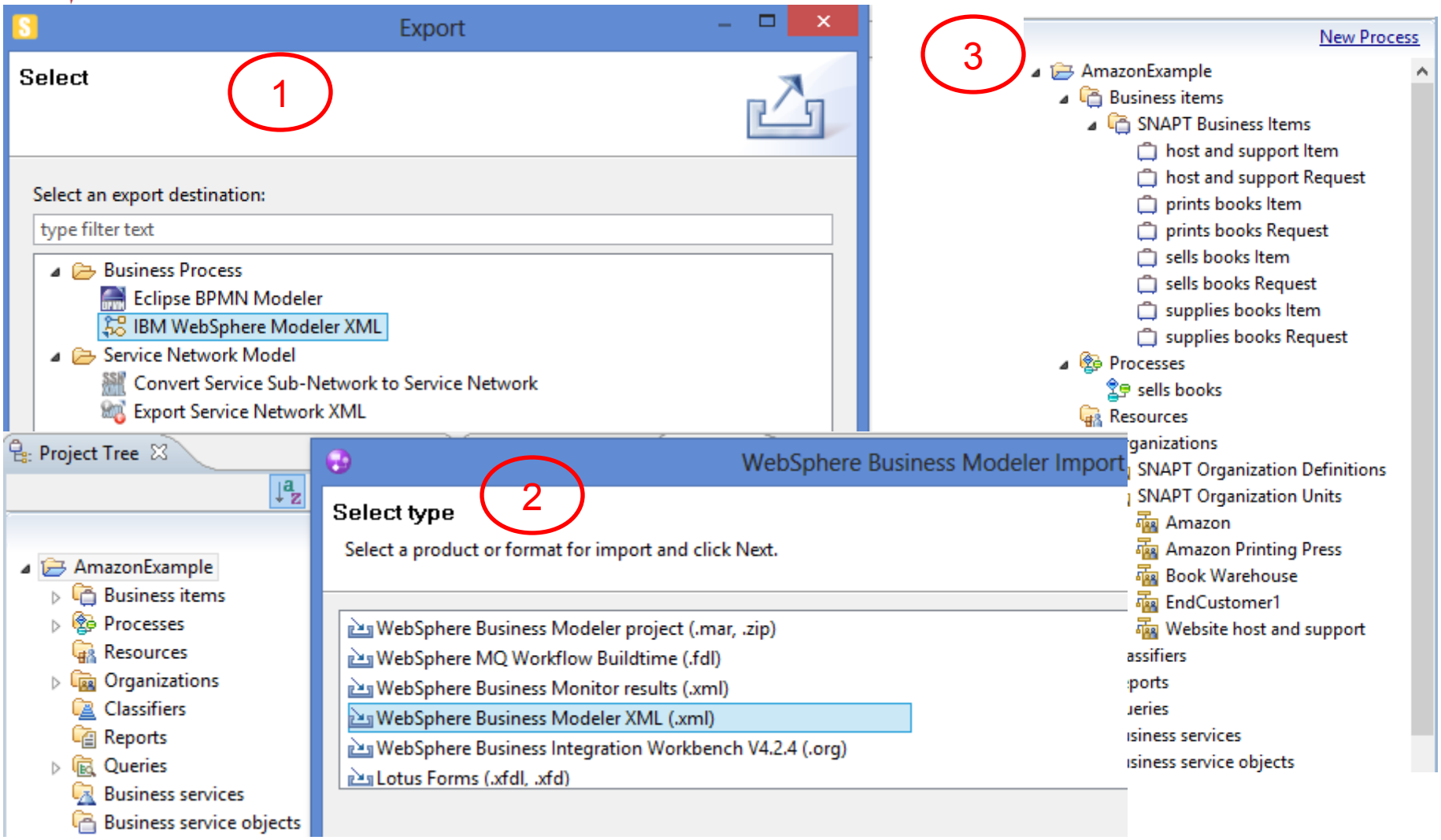


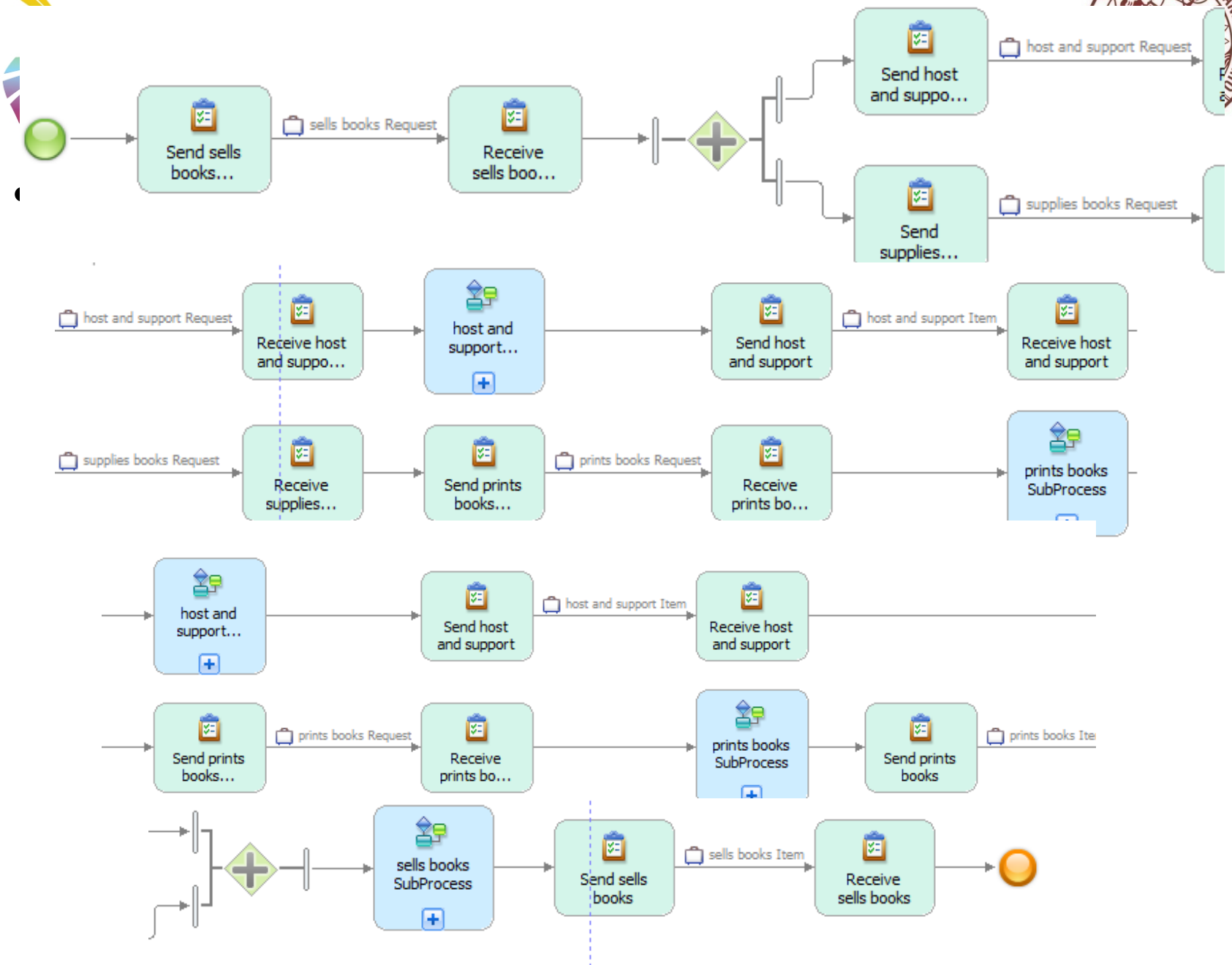
Example 2: Adding Sequencing Information (2/2)

- Adding sequencing information to the sell books service



Example 2 > Exporting and Importing to IBM WBI Modeler




Send sells books...
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Receive sells boo...
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host and support...
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Receive host and support
Send prints books...
prints books Request
Receive prints bo...
prints books SubProcess
Send prints books
prints books Ite
sells books SubProcess
Send sells books
sells books Item
Receive sells books

SNAPT Notes and Known Bugs

- If the file extension of your SNAPT diagram is .sn_diagram (default), then SNAPT should be able to open it. On the other hand, if you have exported it (as an .sn diagram) then you have to import it (not open it).

- Make sure that the name of your SNAPT diagram includes any special characters, such "#",etc.

- **A name (including the space), longer than 31 characters cannot be assigned to participant,sub-network,end customer or enabler.**

- **Some problems may happen due to deletions of edges/entities during the modeling/reconstruction of your service network in SNAPT.**

- **<u>Take backups of your diagrams from time to time.</u>**

References

- *SNAPT User's Manual, Mariana Karmazi, Pantelis Petridis, George Stratakis, Christos Nikolaou*

Τέλος Ενότητας

BY NC ND

Ευρωπαϊκή Ένωση
Ευρωπαϊκό Κοινωνικό Ταμείο

ΕΠΙΧΕΙΡΗΣΙΑΚΟ ΠΡΟΓΡΑΜΜΑ
ΕΚΠΑΙΔΕΥΣΗ ΚΑΙ ΔΙΑ ΒΙΟΥ ΜΑΘΗΣΗ
επένδυση στην κοινωνία της γνώσης
ΥΠΟΥΡΓΕΙΟ ΠΑΙΔΕΙΑΣ & ΘΡΗΣΚΕΥΜΑΤΩΝ, ΠΟΛΙΤΙΣΜΟΥ & ΑΘΛΗΤΙΣΜΟΥ
ΕΙΔΙΚΗ ΥΠΗΡΕΣΙΑ ΔΙΑΧΕΙΡΙΣΗΣ

ΕΣΠΑ 2007-2013
πρόγραμμα για την ανάπτυξη
ΕΥΡΩΠΑΪΚΟ ΚΟΙΝΩΝΙΚΟ ΤΑΜΕΙΟ

Με τη συγχρηματοδότηση της Ελλάδας και της Ευρωπαϊκής Ένωσης

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