Procesos para la Ingeniería de Software

The Business Process Model (BPM)

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Introduction

▶ The Unified Modeling Language (UML) has had a tremendous impact on how software systems are developed

  ▶ Since it's standardization by the OMG (Object Management Group) in November 1997

▶ A common problem is that software systems do not properly support the businesses of which they are an integrated part.

  ▶ A correct requirement specification is not available,

  ▶ the software team does not have a proper understanding of the business,

  ▶ the business changes so frequently that the software can't keep up.

- Business modeling helps you understand the actual business
  - its goals, processes (activities), resources (people, machines, and material) and rules.

- A better understanding of how the business functions facilitates improvements to the business, and helps to identify new business opportunities (i.e., business improvement or innovation).
  - and how to use the business models to identify the correct **requirements** for the software that supports the business.
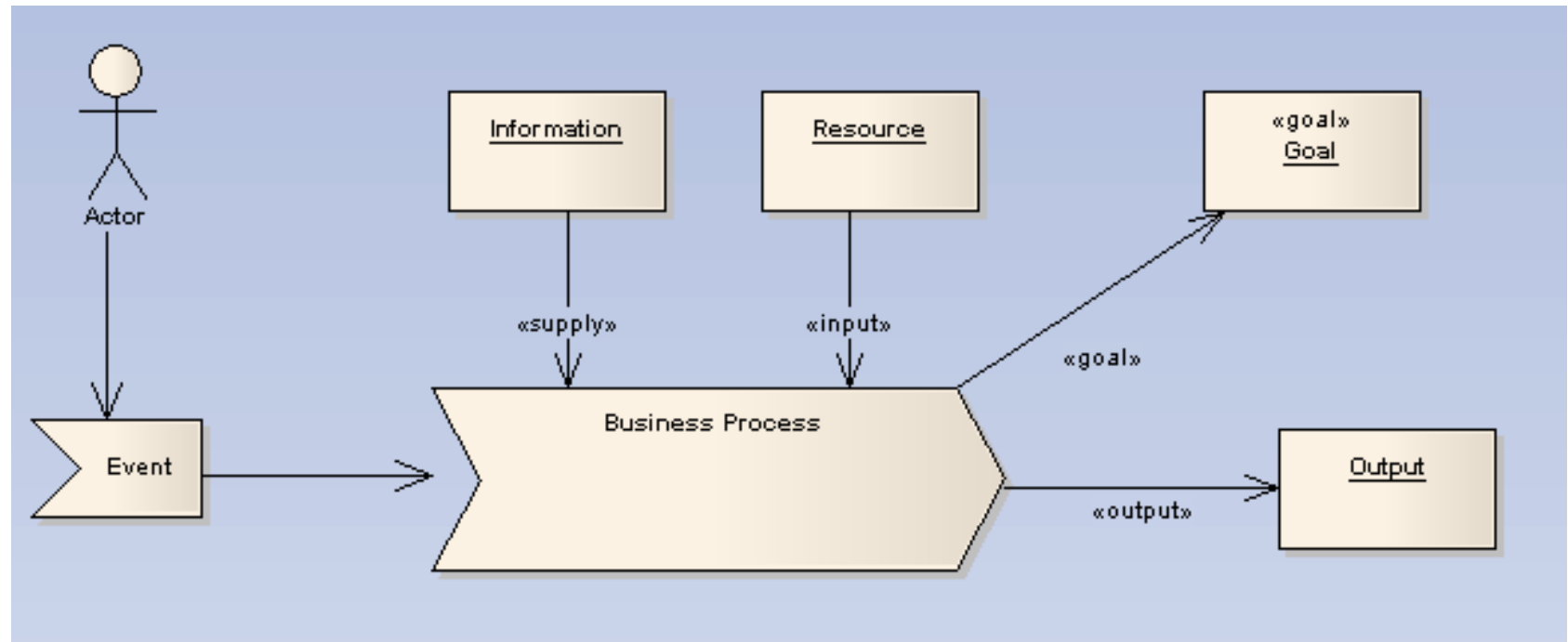
A business process:

1. Has a **Goal**

2. Has specific **inputs**

3. Has specific **outputs**

4. Uses **resources**

5. Has a number of **activities** that are performed in some order.

6. May affect more than one organizational unit. Horizontal organizational impact.

7. **Creates value** of some kind for the customer. The customer may be internal or external.

▸ A business process is a collection of activities designed to produce a specific output for a particular customer or market.

▸ It implies a strong emphasis on how the work is done within an organization,

    ▸ in contrast to a product's focus

UML "extensions"

▸ Two well respected and proven UML "extensions"

    ▸ The first is Business Process Modeling Notation (BPMN), which has gained enormous popularity and is rapidly becoming a new standard for modeling and designing business processes.

    ▸ The second is the Eriksson-Penker profile which has less popularity, but still provides a unique and powerful means of visualizing and communicating business processes and the necessary flow of information within an organization.

Eriksson-Penker Notation

Elements

▸ Supply link from object *Information*.

▸ Supply link from object *Resource*.

▸ Object flow link to object *Output*

▸ Object flow link from event *Event*.

Goal

▸ A business process has some well defined goal.

  ▸ This is the reason the organization does this work,

  ▸ should be defined in terms of the benefits this process has satisfying the business needs.

▸ A *Goal link* indicates the attached object to the business process describes the goal of the process.

▸ A goal is the business justification for performing the activity.

Information

- Business processes use information to tailor or complete their activities.
- Information, unlike resources, is not consumed in the process – rather it is used as part of the transformation process.
  - Information may come from external sources, from customers, from internal organizational units and may even be the product of other processes.
- A *Supply link* indicates that the information or object linked to the process is not used up in the processing phase.
  - For example, order templates may be used over and over to provide new orders of a certain style – the templates are not altered or exhausted as part of this activity.

Resource

- A resource is an input to a business process.

- Unlike information, is typically consumed during the processing.

  - For example, as each daily train service is run and actuals recorded, the service resource is 'used up' as far as the process of recording actual train times is concerned.

- An Input link indicates that the attached object or resource is consumed in the processing procedure.

  - As an example, as customer orders are processed they are completed and signed off, and typically are used only once per unique resource (order).

Event

- An object flow link indicates some object is passed into a business process.

- It captures the passing of control to another entity or process,
  - with the implied passing of state or information from activity to activity.
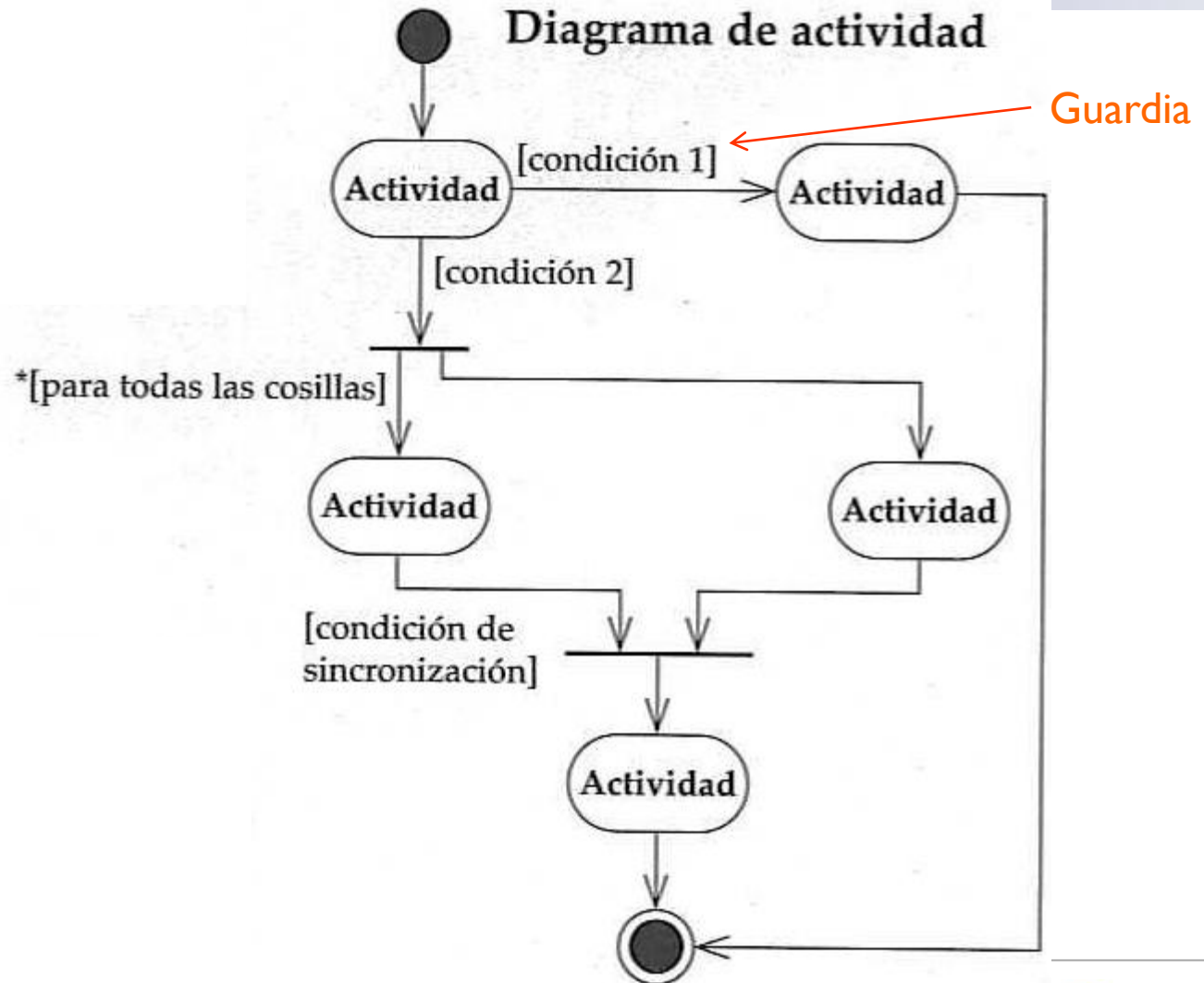
Examples
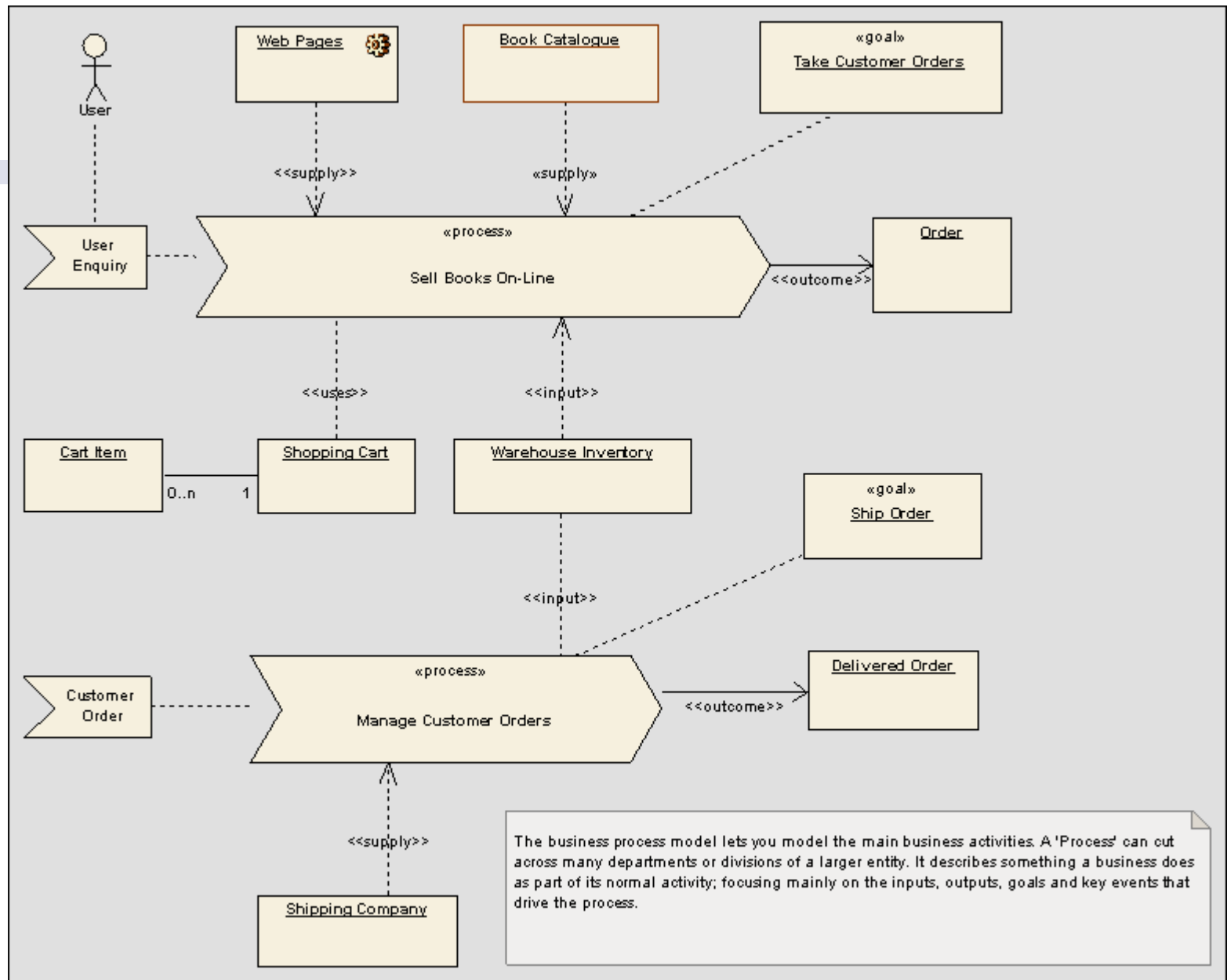
Actividades y tareas

1. Realizar un diagrama en la herramienta CASE Enterprise Architect usando la notación extendida de Eriksson-Penker.

   ▶ El proceso a modelar será el de inscripción a la FEI.

   ▶ Modelar los procesos: «Asignación de prácticas profesionales» y «Acreditación EE proyecto guiado».

2. Investigar sobre BPMN y elaborar una presentación con diapositivas. Incluir un ejemplo.

   ▶ Leer el artículo *UML Tutorial. The Business Process Model* y complementar en Internet. NO WIKIPEDIA

Diagrama de actividades

Diagrama de Actividades

- Ve la secuencia general de las acciones de varios objetos y casos de uso o procesos.

- Modela flujo de trabajo o de cómputos; similar a diagrama de flujo.

- Son útiles para describir métodos complicados.

- El diagrama de actividades me permite seleccionar el orden en el que se harán las cosas.

- Pueden manejar procesos paralelos.

- Muestra diferentes roles o responsabilidades (swimlanes o carriles).

- Supone no hay interferencia de eventos externos; transiciones por terminación.
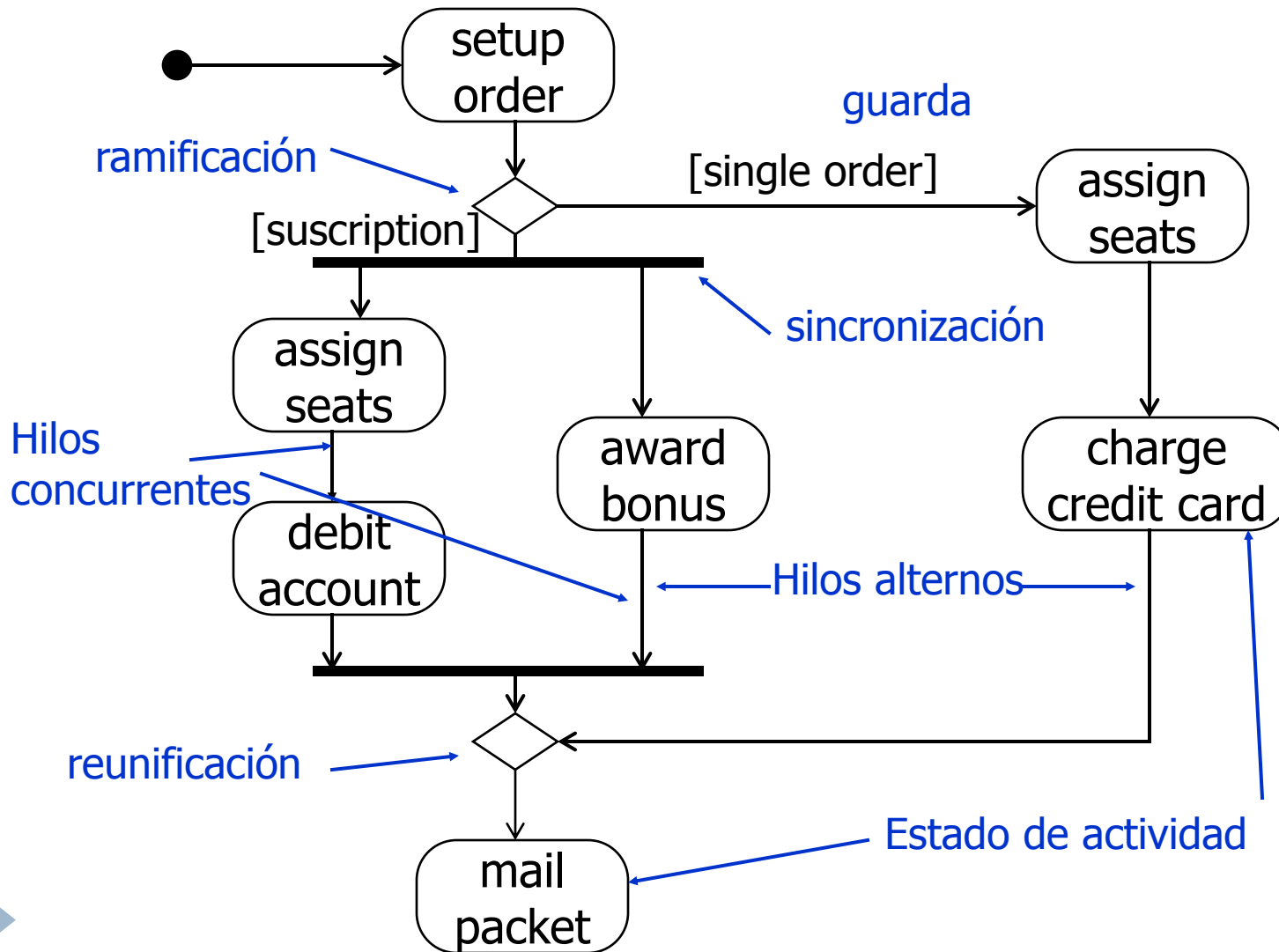
Elementos de un diagrama de actividades

Diagrama de actividad

Guardia

Actividad [condición 1] Actividad

[condición 2]

*[para todas las cosillas]

Actividad Actividad

[condición de sincronización]

Actividad

Vista de actividades

▸ Partes que puede tener:

- ▸ estados de actividad
- ▸ estados de acción (atómicos)
- ▸ transiciones
- ▸ ramificaciones
- ▸ sincronizaciones
- ▸ objetos en flujo
- ▸ carriles (cuando hay varias clases)

- Actividad: tarea que puede ser llevada a cabo por un humano o una computadora.

- Guardia: Expresión lógica que se evalúa como «verdadero» o «falso».

- Rombo indica bifurcación (fork)

- Disparador de inicio

- Barras de sincronización.

- Fin

Diagrama de actividades

setup order

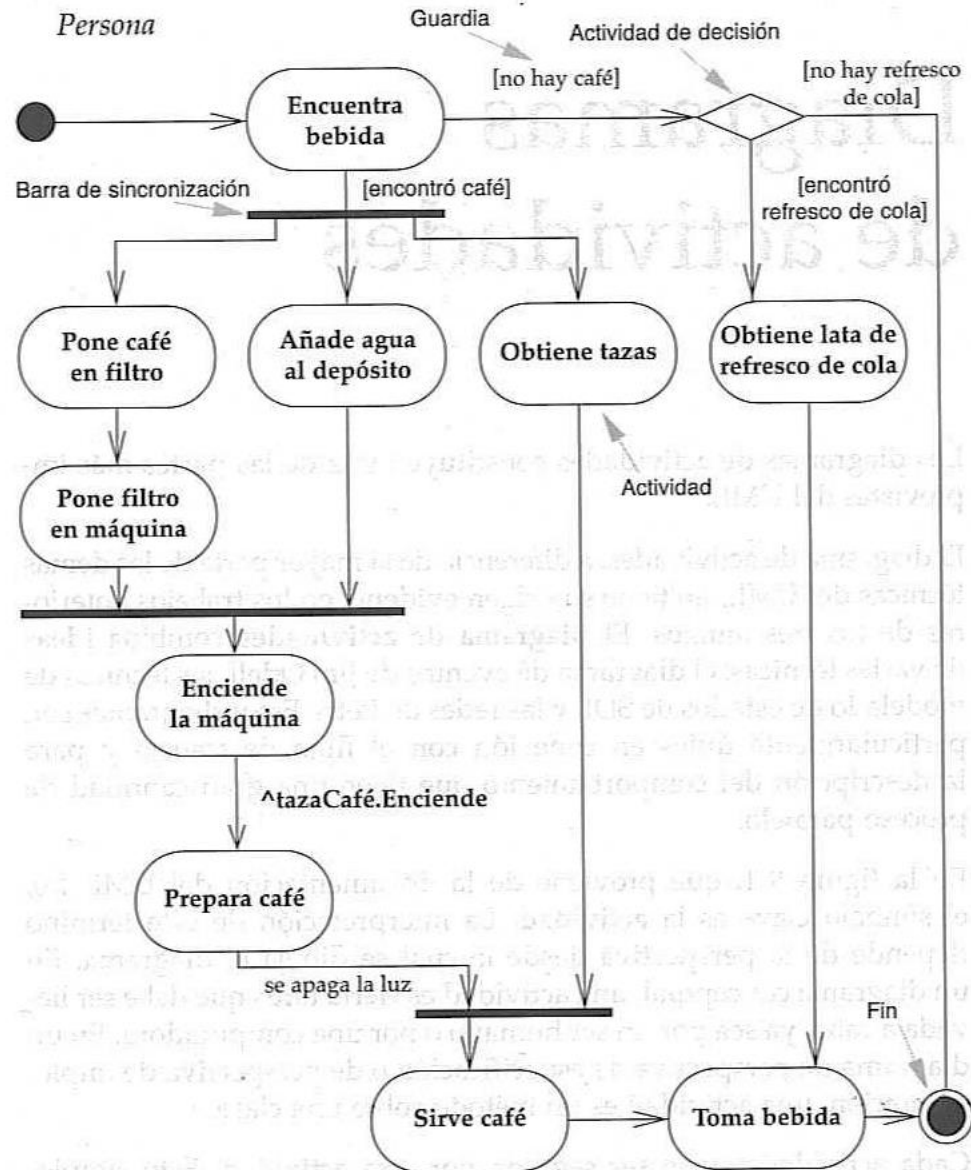guarda

ramificación

[single order]

assign seats

[suscription]

sincronización

assign seats

Hilos concurrentes

award bonus

charge credit card

debit account

Hilos alternos

reunificación

Estado de actividad

mail packet

Despachar café

Diagrama de actividades

carriles

Customer | Sales | Stockroom

request service

Order [placed]

take order

Order [entered]

pay

Order [filled]

fill order

deliver order

Order [delivered]

objeto en flujo [estado]

collect order
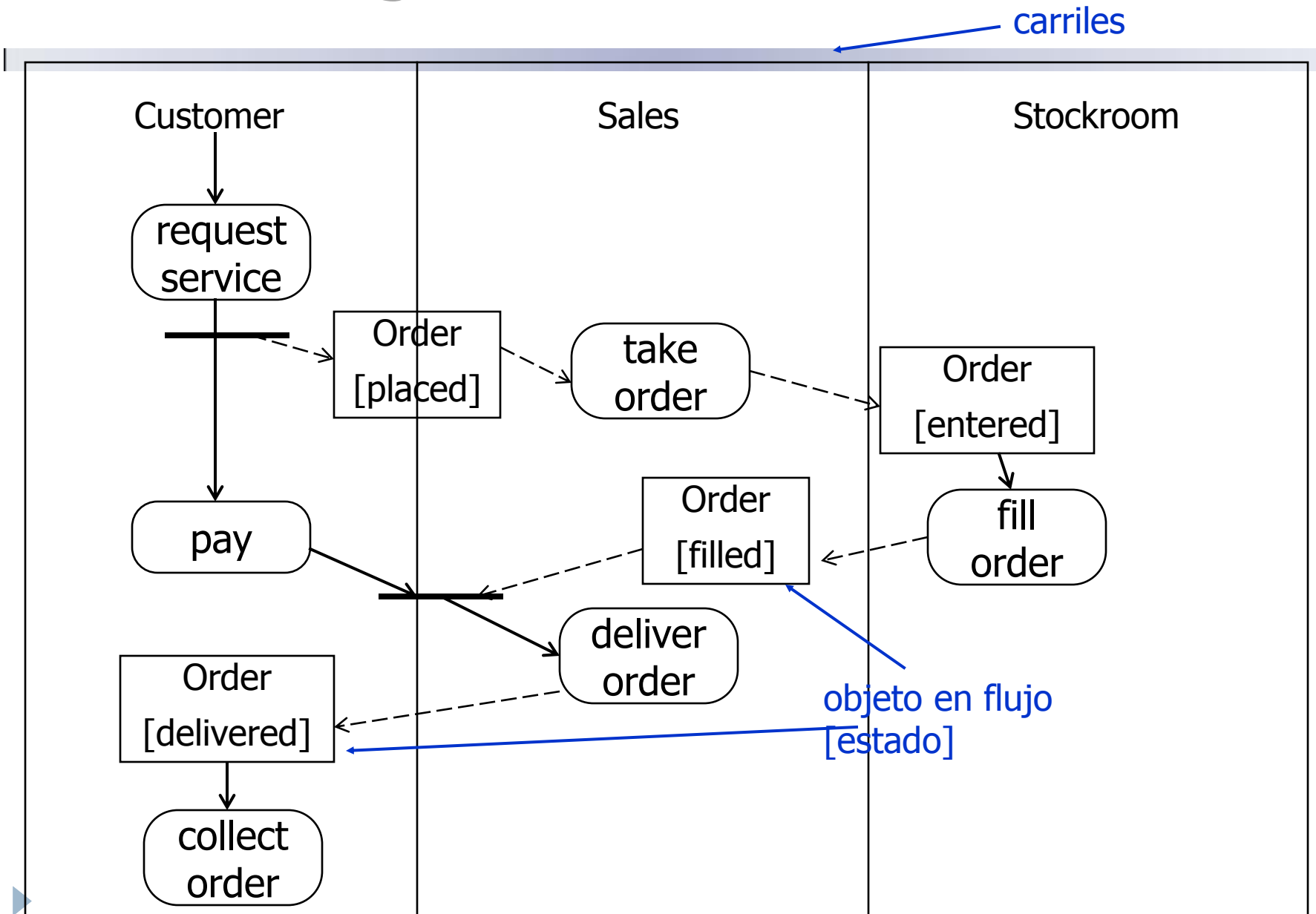
Ejemplo: Préstamo de software

Jefe de Sistemas	Empleado

Recibe formato

Barra de sincronización

Disparador múltiple

* : [por cada CD solicitado]

Comprueba adeudo

Comprueba existencia sw

Préstamo denegado

[Adeudos anteriores]

[existencia]

Comprueba existencia CD

[No adeudos]

[existencia]

Imprime formato

Firma formato

Punto de terminación opcional
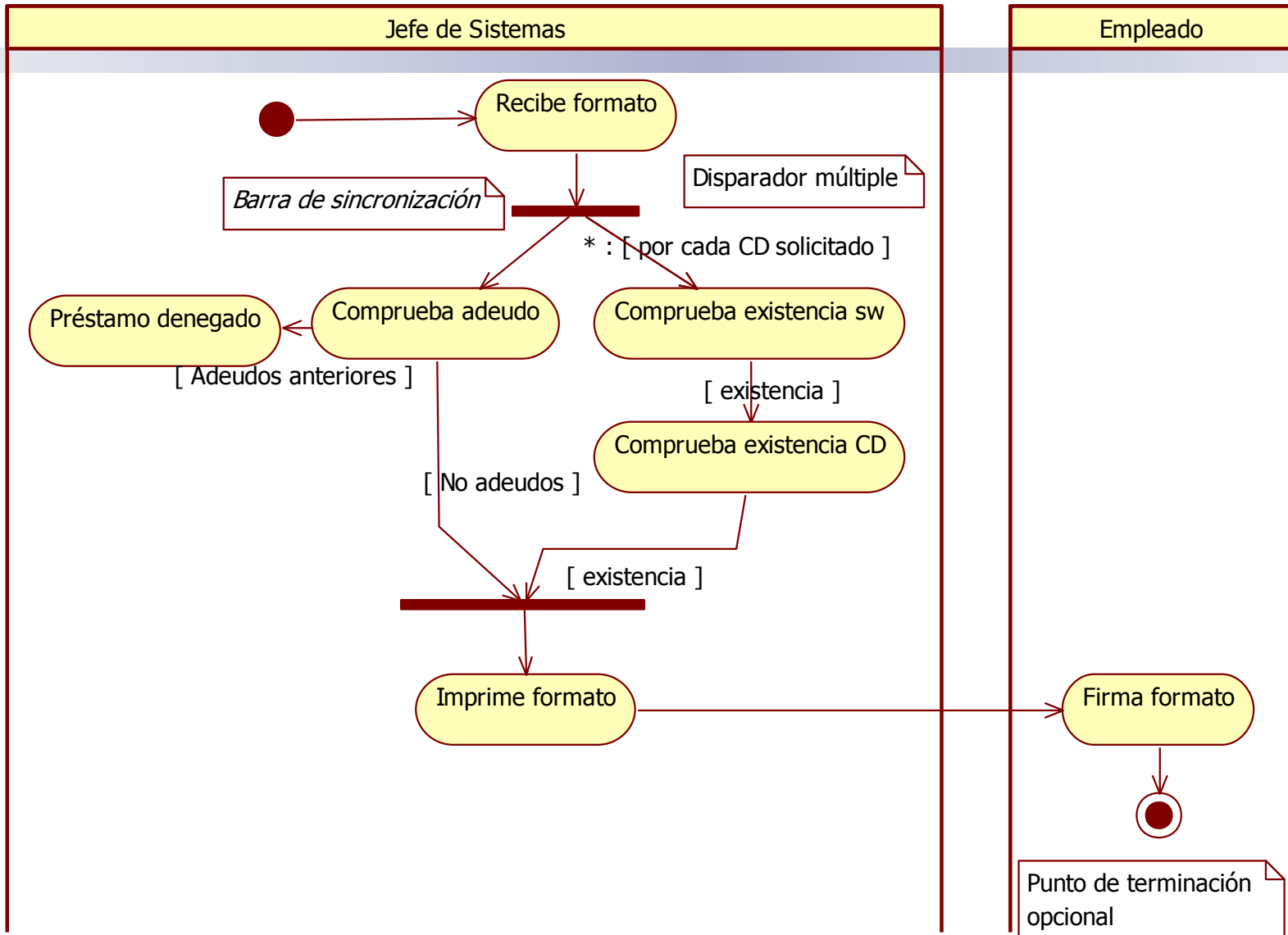
Actividades

▸ Realice el diagrama de actividades de los siguientes procesos:

▸ Inscripción en la FEI

▸ Asignación de prácticas profesionales

▸ Acreditación EE proyecto guiado

References

- Hans-Erik Eriksson and Magnus Penker. **Business Modeling with UML: Business Patterns at Work,** John Wiley & Sons © 2000 (459 pages)

- Sparx Systems. **UML Tutorial. The Business Process Model.** © Sparx Systems 2007

- Martin Fowler, Kendall Scott. **UML Gota a Gota.** Person Education, 1999.

- Guía de Usuario de Enterprise Architect 7.0
  - http://www.sparxsystems.com.ar/download/ayuda/index.html?analysisdiagram.htm