

# Introduction to Business Process Modeling

Prof. Chao Ou-Yang  
Dept. of Industrial Management  
National Taiwan University of Science and Technology

1

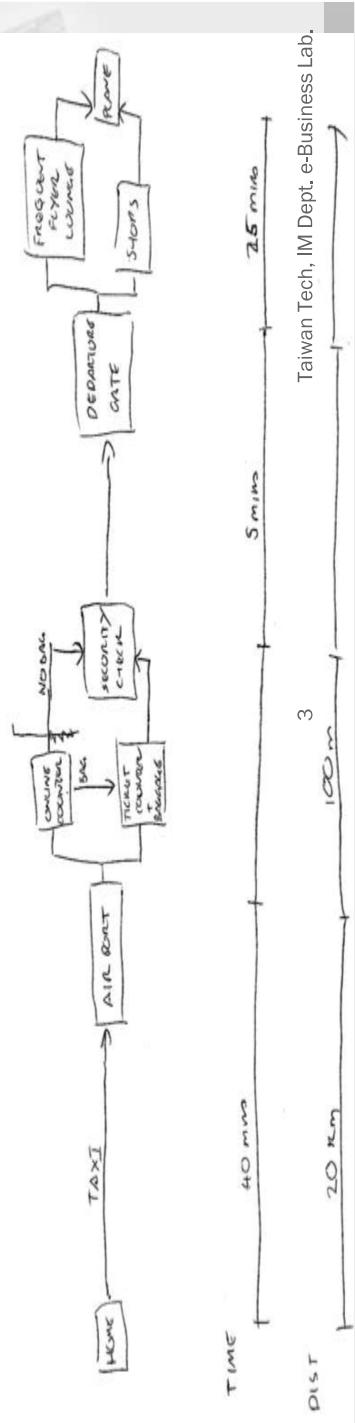
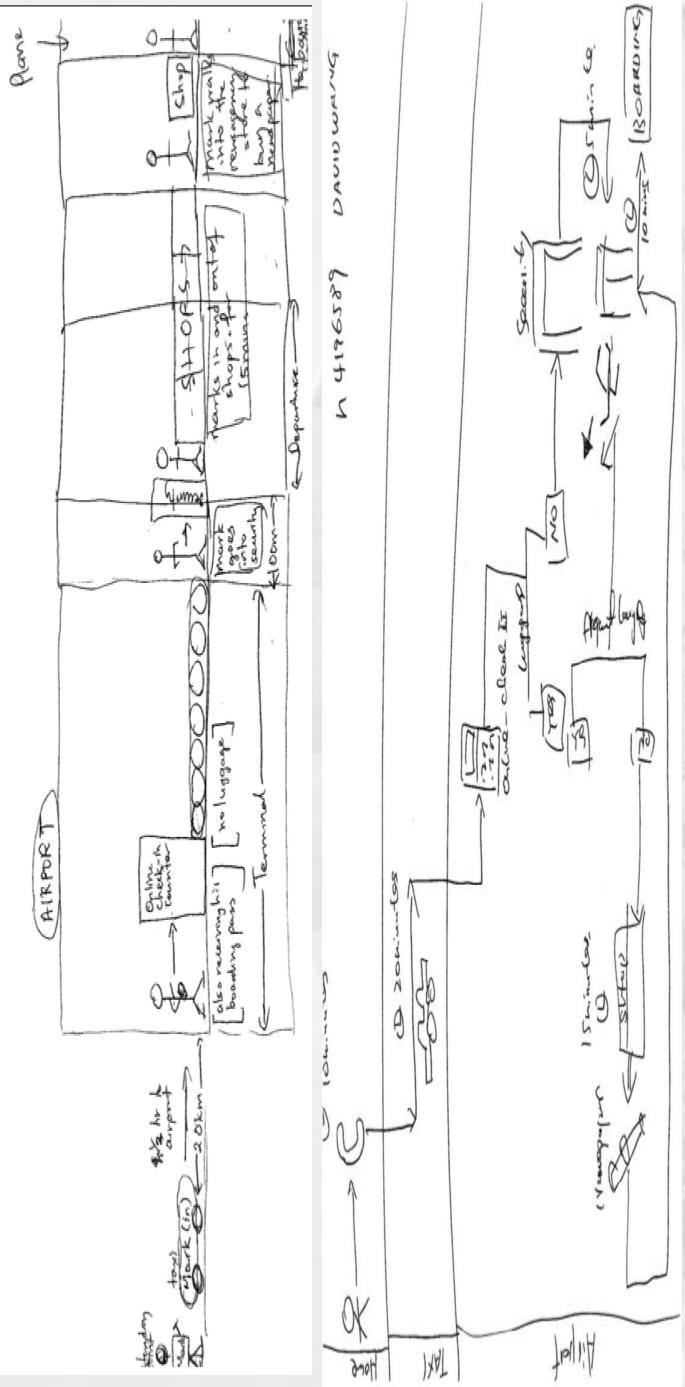
Taiwan Tech, IM Dept, e-Business Lab.

## How to Model a Business Process

- \* Mark is going on a trip. He decides to call a Uber from home to the airport. The Uber arrives after 10 minutes, and takes half an hour for the 10 kilometers to Taipei airport. At the airport, Mark uses the online check-in counter and receives his boarding pass. Of course, he could have also used the ticket counter. He does not have to check-in any luggage, and so he proceeds straight to the security check, which is 100 meters down the hall on the right. The queue here is short and after 5 minutes he walks up to the departure gate. Mark decides not to go to the Frequent Flyer lounge and instead walks up and down the shops for 15 minutes and buys a newspaper before he returns to the gate. After ten minutes waiting, he boards the plane.

2

Taiwan Tech, IM Dept, e-Business Lab.



## Questions considered

1. Who are the actors in this process?
  2. Which actors can be considered to be the customer (or customers) in this process?
  3. What value does the process deliver to its customer(s)?
  4. What are the possible outcomes of this process?

# What is a Model

- \* Models are abstractions from real world phenomena, developed for the purpose of reducing overall complexity.
- \* Models aggregate information and document only relevant aspects of the real world.
- \* Models are being developed in a specific modelling subject for a specific target audience with a specific modelling purpose in mind.

5

Taiwan Tech, IM Dept, e-Business Lab.

## Business process & Business Process Management (BPM)

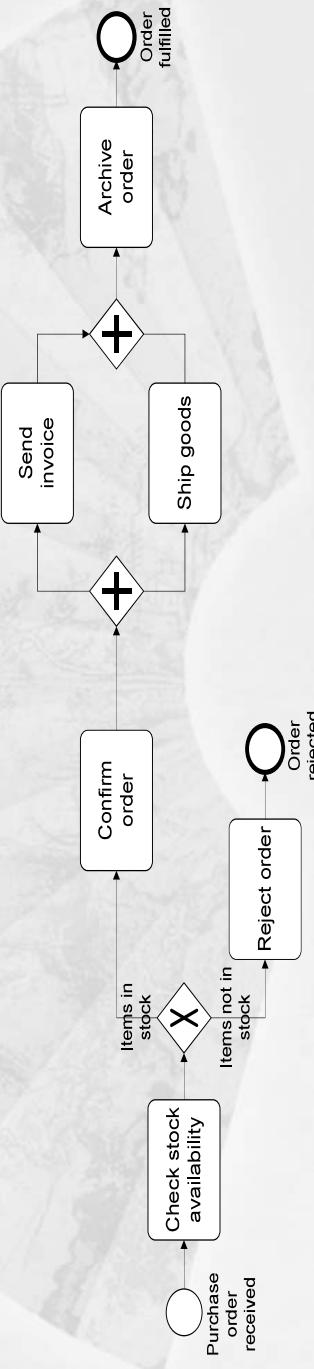
- \* Business Process
  - \* a collection of inter-related events, activities and decision points that involve a number of actors and objects, and that collectively lead to an outcome that is of value to at least one customer.
- \* BPM
  - \* a body of methods and tools to discover, analyze, redesign, execute and monitor business processes.

# Four principles of BPM

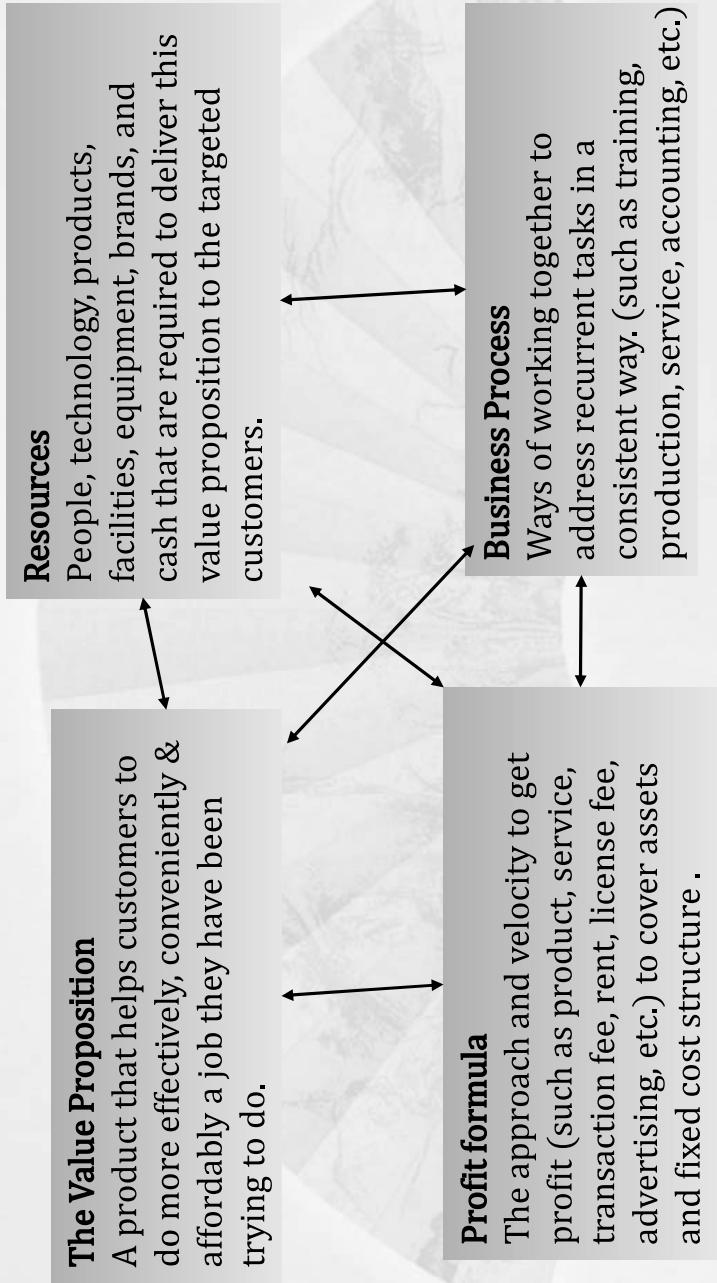
- \* Modeling — *Graphically defining or building a business process representation for all needed process assets.*
- \* Integrating — *Connecting process assets so they can seamlessly exchange information to achieve goals. For applications, this means using Application Program Interfaces (APIs) and messaging. For people, this means creating a workspace on the desktop or wireless device for fulfilling their part of the process.*
- \* Monitoring — *Providing a graphical administrative console that shows processes in progress, completed processes, and associated metrics.*
- \* Optimizing — *Analyzing, through a common user interface, the monitored processes to look for inefficiencies, and the ability to act on or change processes in real-time to improve efficiency.*

# What is a Business Process Model

- \* Collection of related events, activities and decisions, that involve a number of actors and objects, and that collectively lead to an outcome that is of value to an organization or its customers.
- \* Examples:
  - \* Order-to-Cash: a type of process performed by a vendor, which starts when a customer submits an order to purchase a product or a service and ends when the product or service in question has been delivered to the customer and the customer has made the corresponding payment.



# Business Process and Business Model



9

Taiwan Tech, IM Dept, e-Business Lab.

## Elements of a Business Process



10

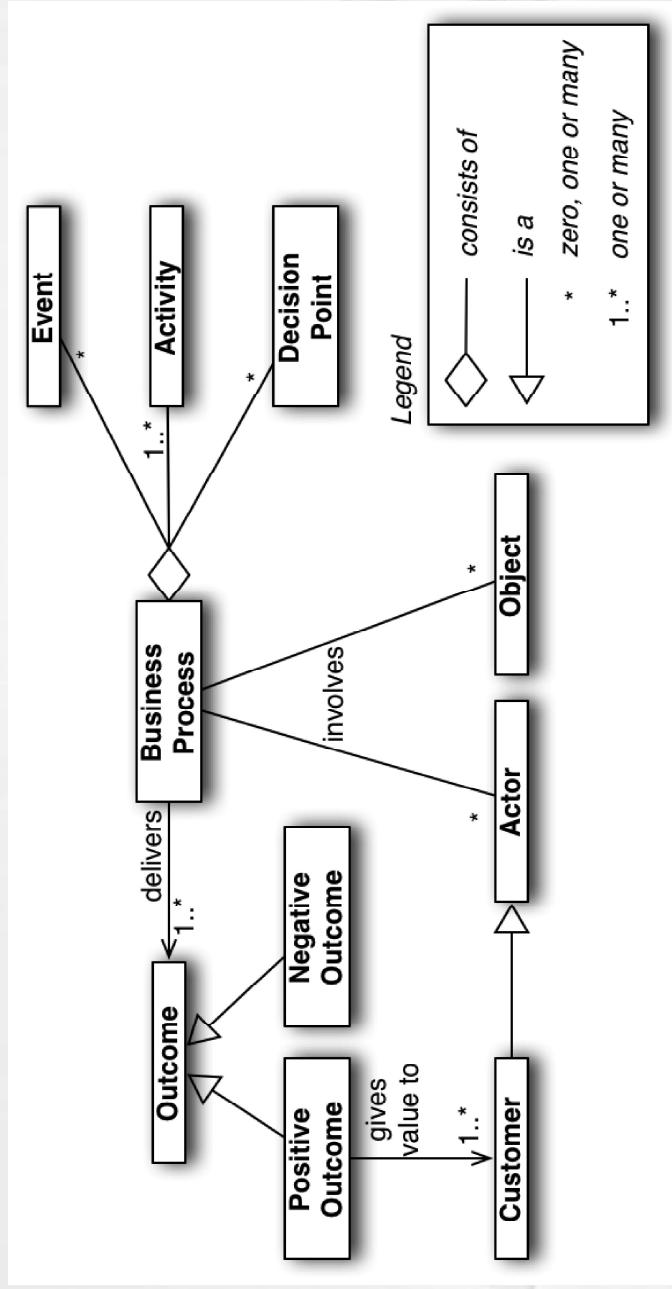
Taiwan Tech, IM Dept, e-Business Lab.

# A Business Process

- \* When these documents are received by the admissions office, an officer checks the completeness of the documents. If any document is missing, an e-mail is sent to the student. The student has to send the missing documents by post. Assuming the application is complete, the admissions office sends the certified copies of the degrees to an academic recognition agency, which checks the degrees and gives an assessment of their validity and equivalence in terms of local education standards. This agency requires that all documents be sent to it by post, and all documents must be certified copies of the originals. The agency sends back its assessment to the university by post as well. Assuming the degree verification is successful, the English language test results are then checked online by an officer at the admissions office. If the validity of the English language test results cannot be verified, the application is rejected (such notifications of rejection are sent by e-mail).

## Exercise

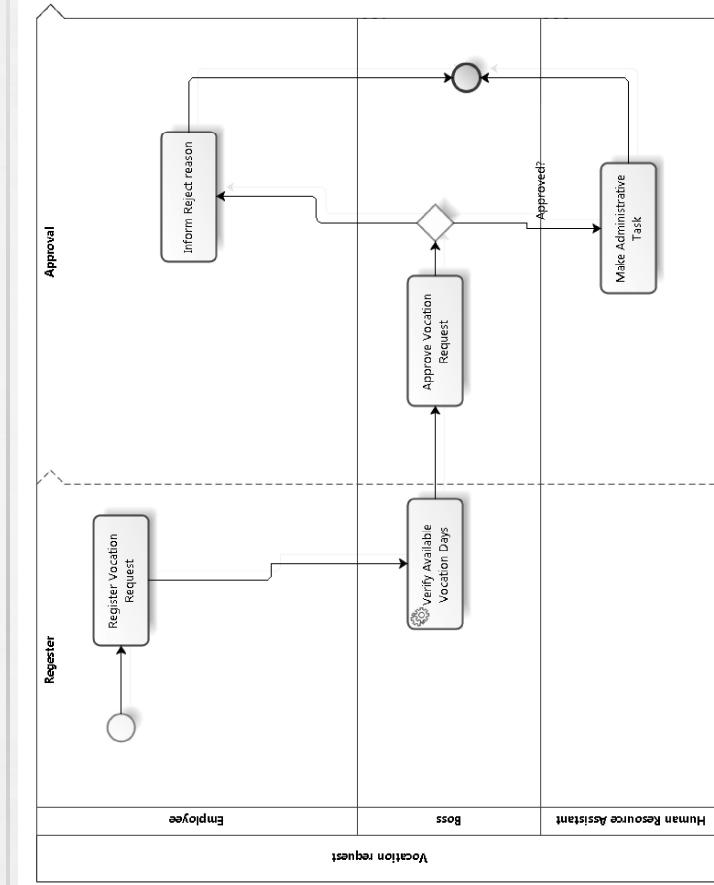
- \* Please specify the activities of the BP.
- \* Please specify the events, actors and resources for each of the activities of the BP.



Taiwan Tech, IM Dept., e-Business Lab.

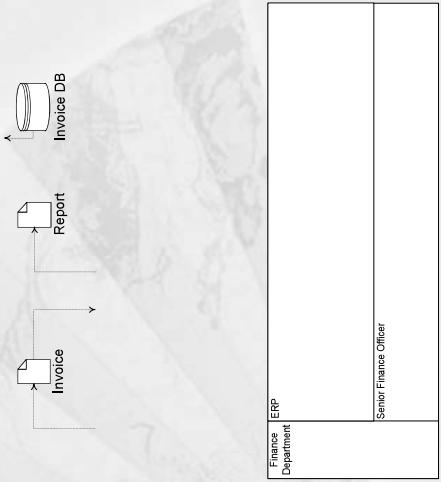
# What is a Business Process Model

- \* Identify
    - \* Events
    - \* Activities
    - \* Decisions
    - \* Objects
    - \* Customers value



# Process Perspectives

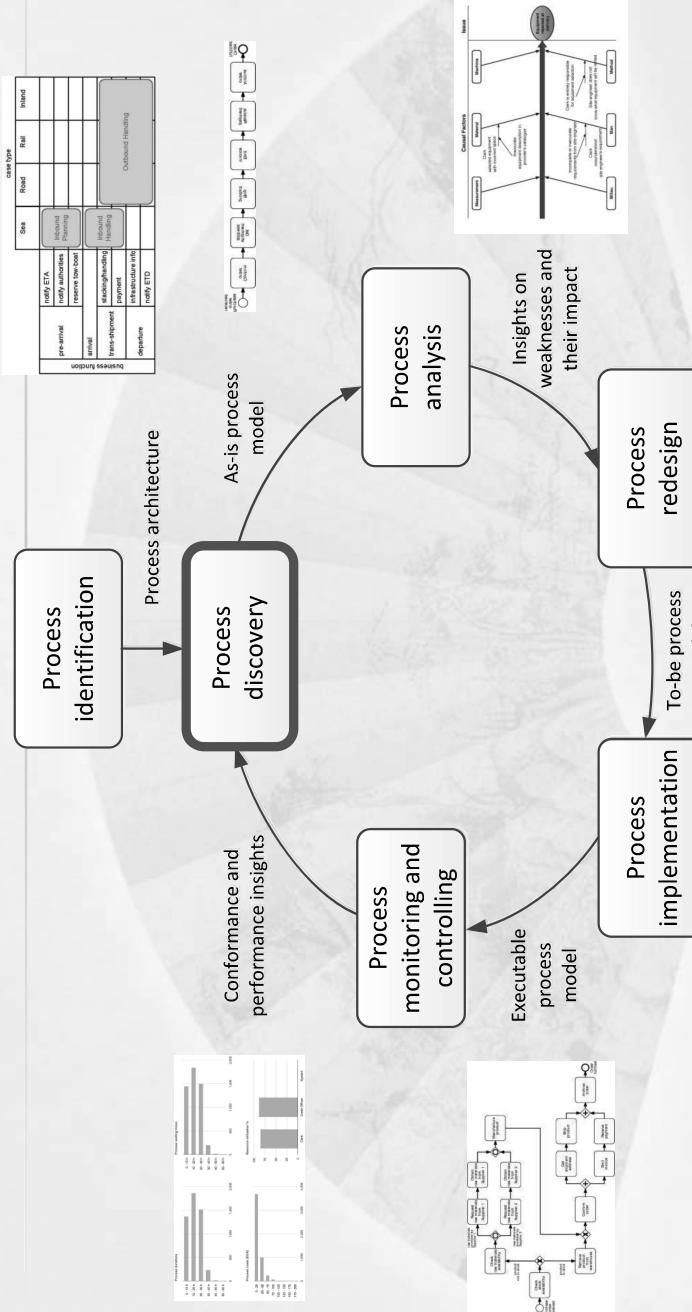
- \* Control Flow Perspective
  - \* “what needs to be done and when”
  - \* predecessor/successor relationship among activities and events
  - \* the central information depicted in a process model
- \* Data Perspective
  - \* “who’s doing the work”
  - \* input/output data to activities
  - \* complements the control flow
- \* Resource Perspective
  - \* “what do we need to work on”
  - \* human participants and systems that perform control flow activities and generate events
  - \* complements the control flow



Taiwan Tech, IM Dept., e-Business Lab.

15

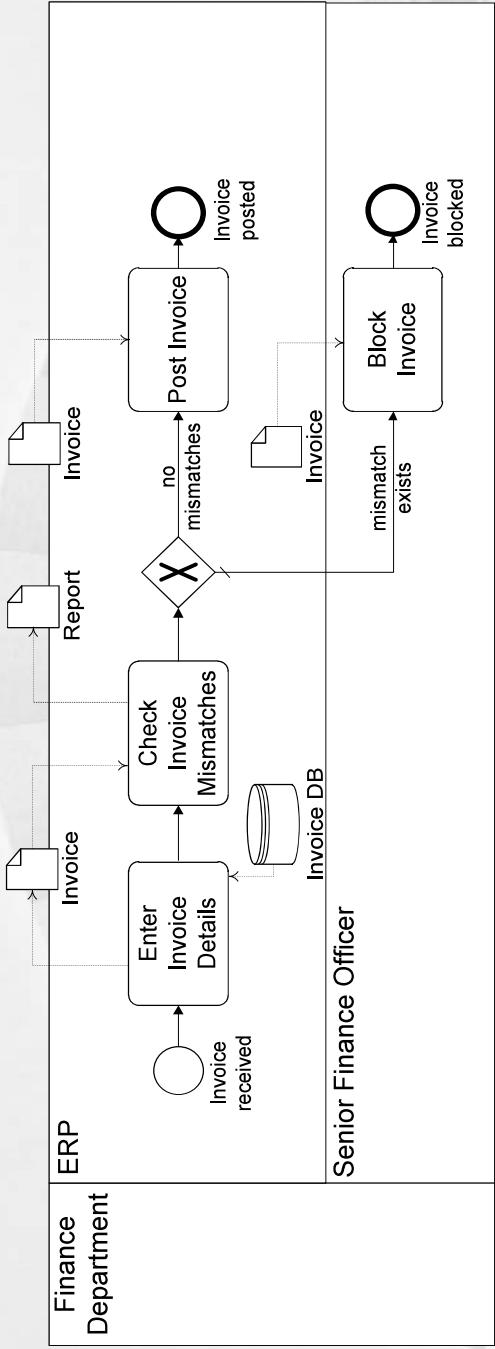
# The BPM lifecycle



Taiwan Tech, IM Dept., e-Business Lab.

# Business process model

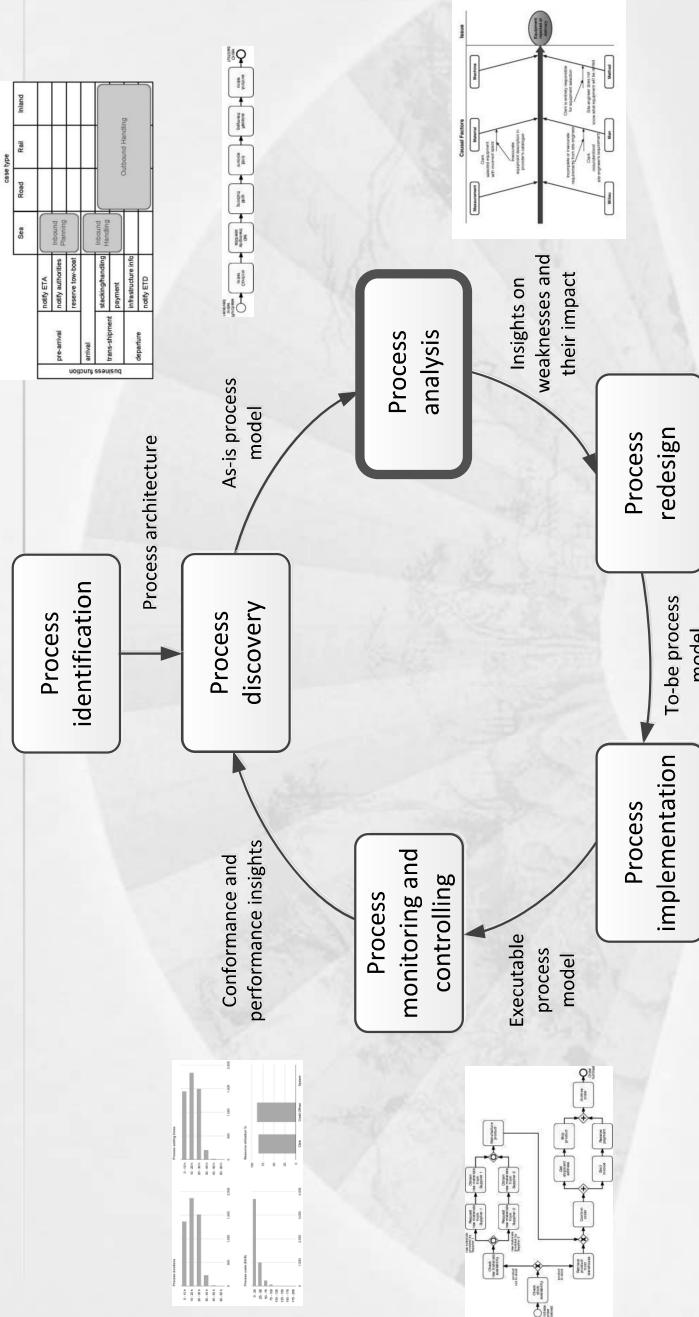
## Invoice handling example



Taiwan Tech, IM Dept., e-Business Lab.

17

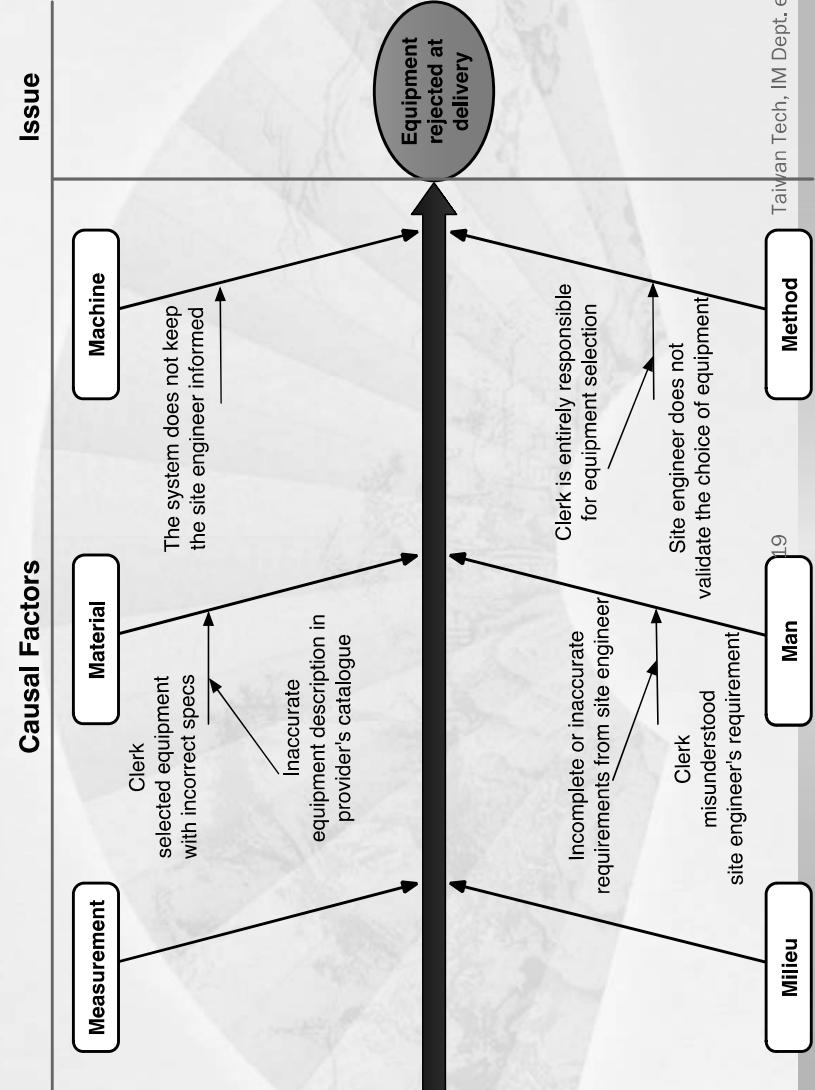
# The BPM lifecycle



Taiwan Tech, IM Dept., e-Business Lab.

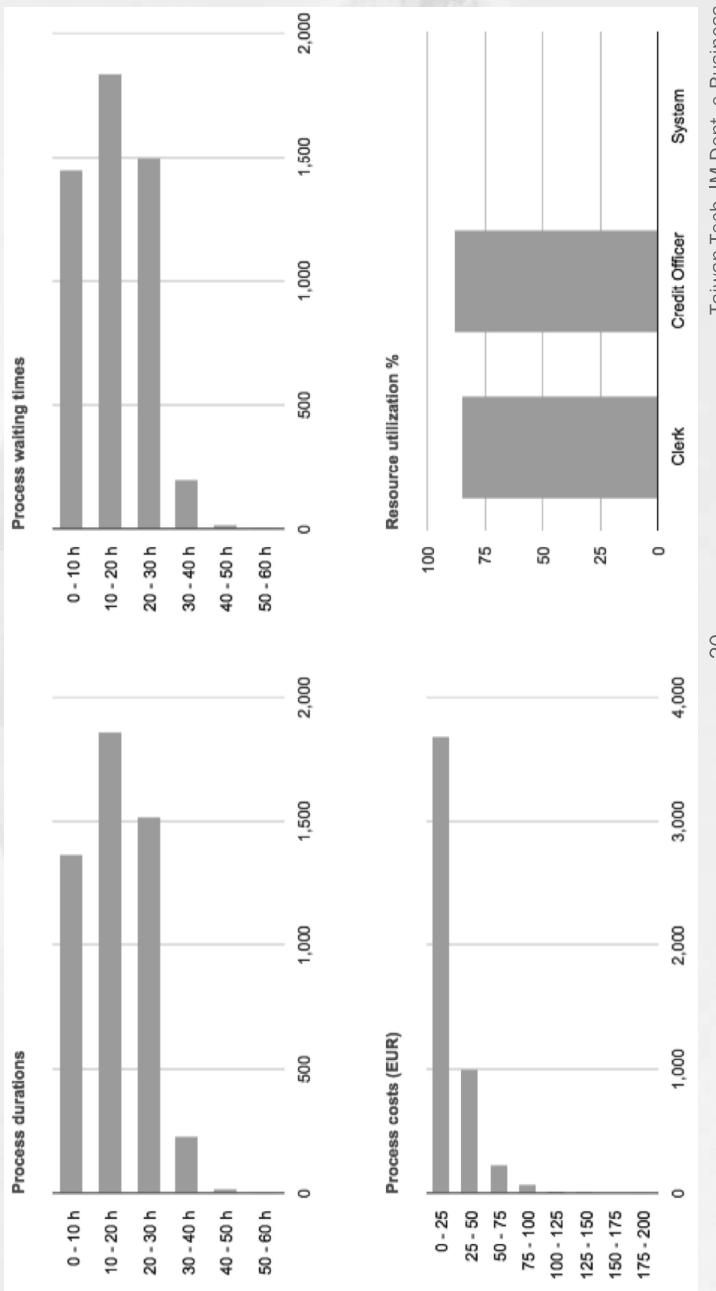
# Qualitative process analysis

## Root-cause analysis example

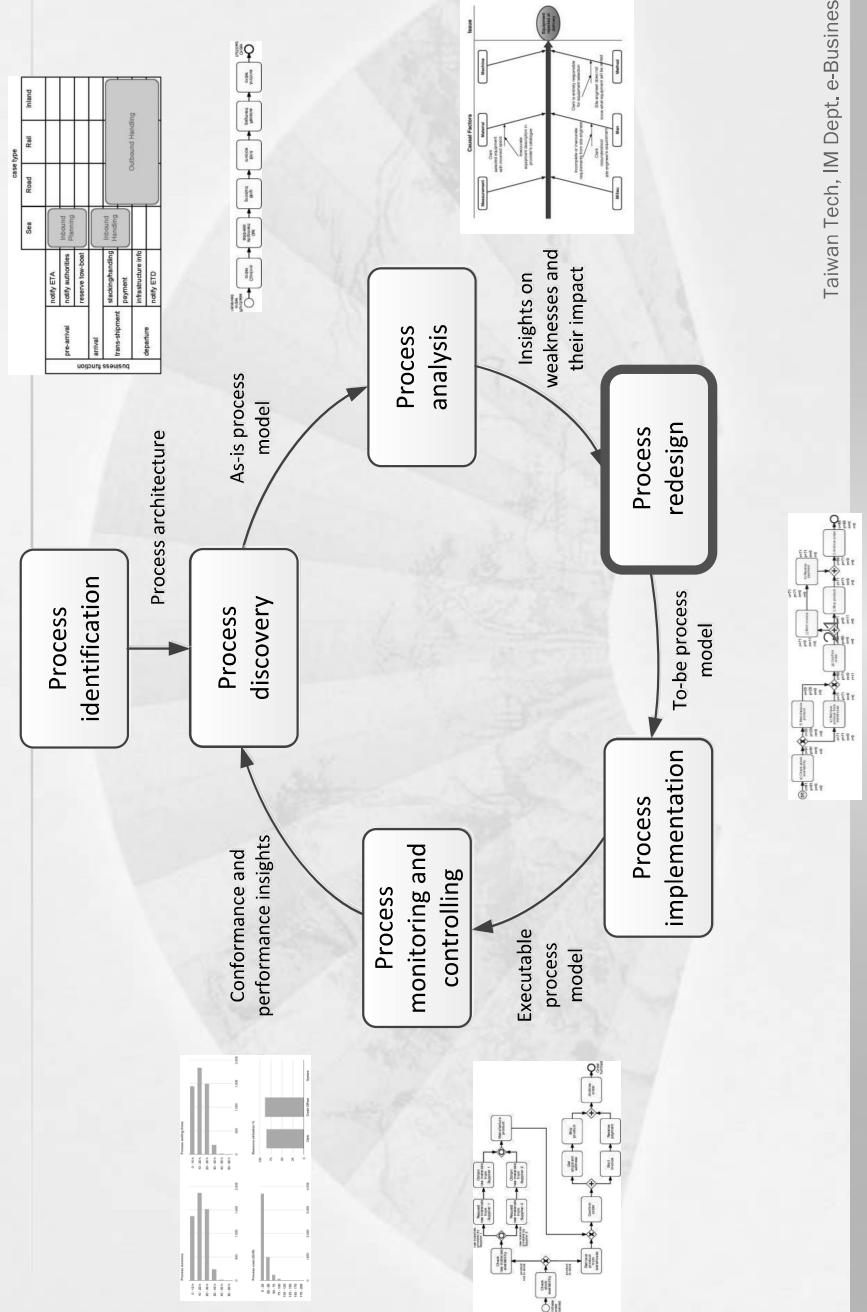


# Quantitative process analysis

## Process simulation example



# The BPM lifecycle

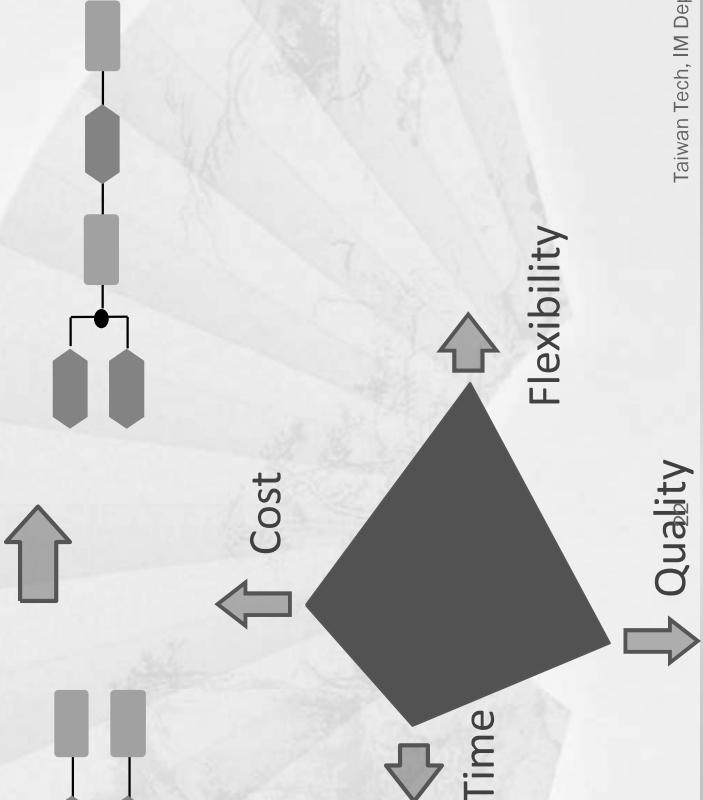


# Process redesign

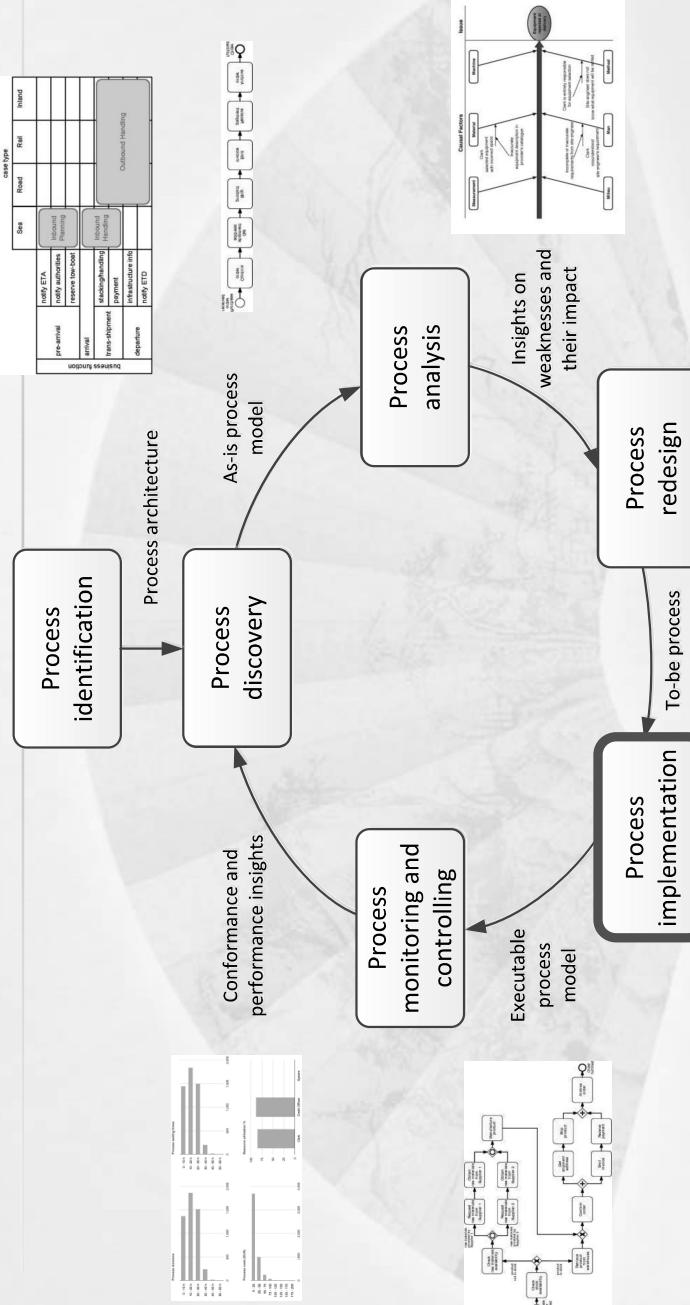
## AS-IS process model



## TO-BE process model

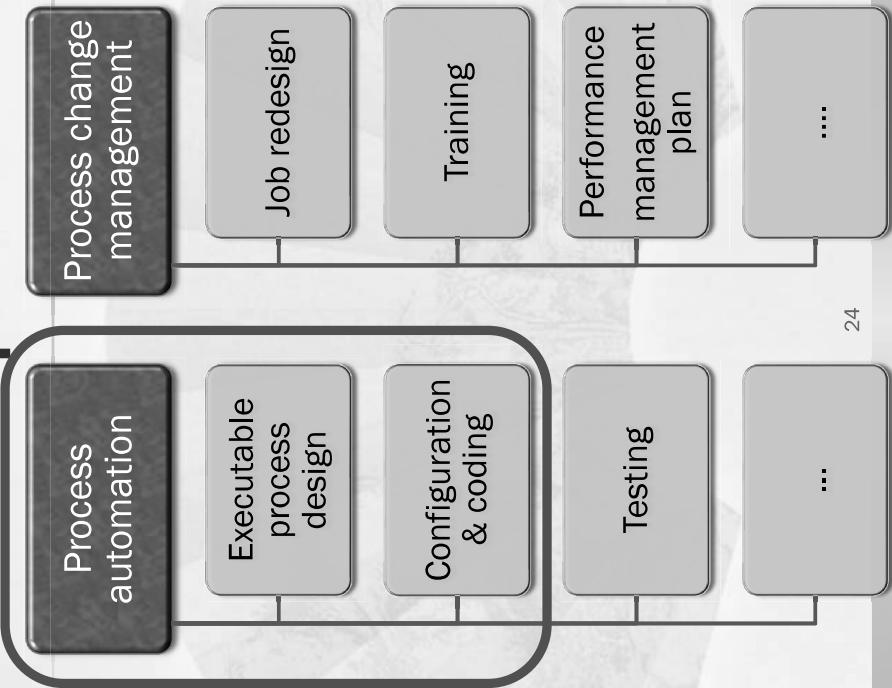


# The BPM lifecycle



Taiwan Tech, IM Dept., e-Business Lab.

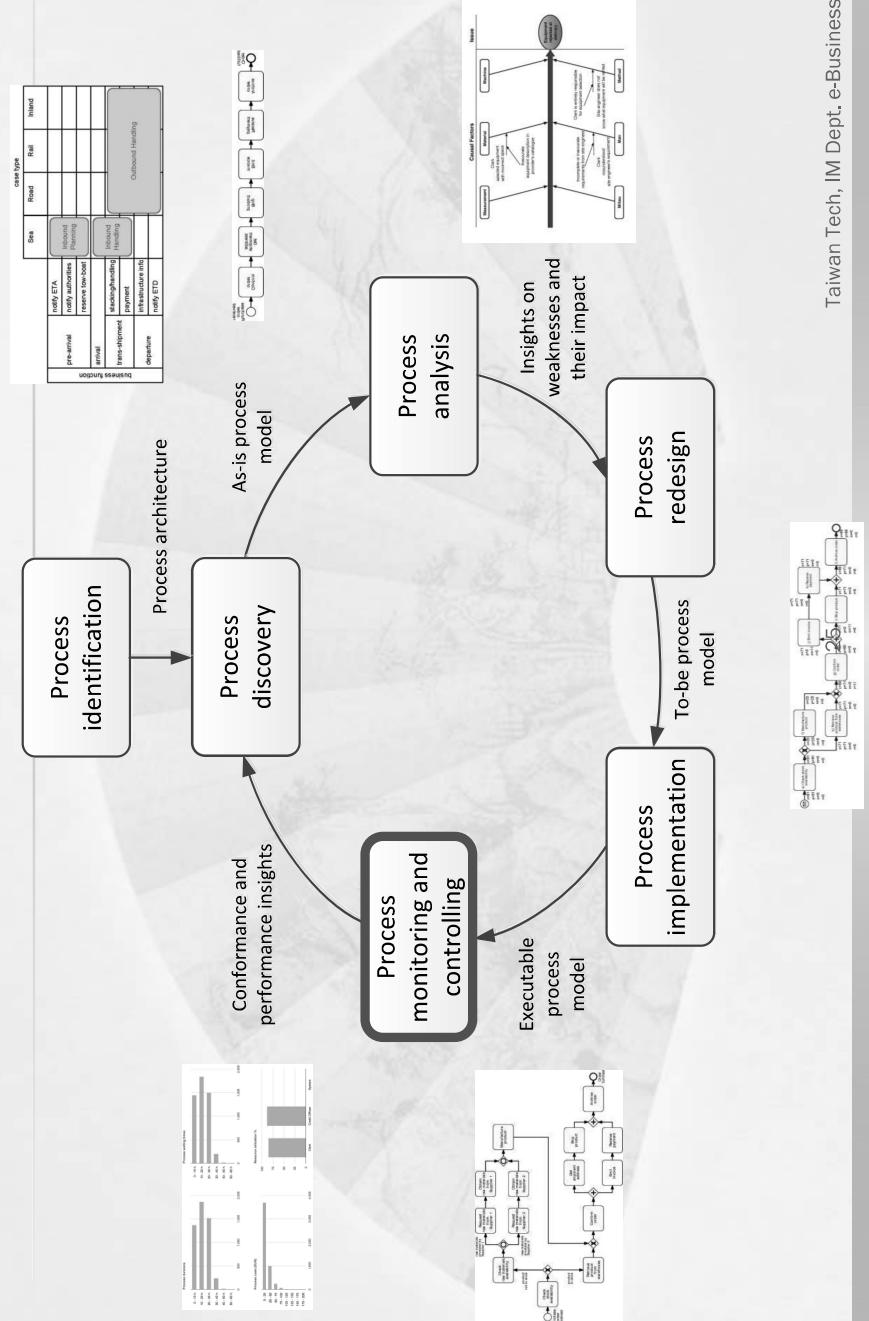
# Process implementation



24

Taiwan Tech, IM Dept., e-Business Lab.

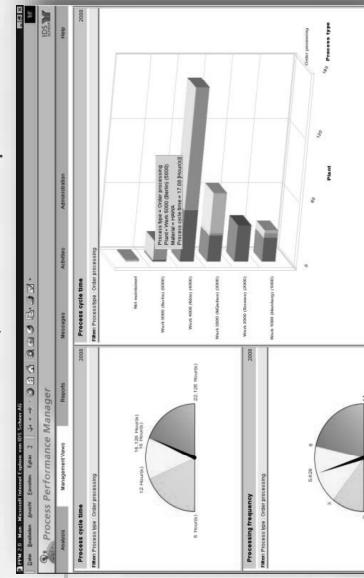
# The BPM lifecycle



Taiwan Tech, IM Dept, e-Business Lab.

# Process monitoring & controlling

Dashboards, alerts & reports



Model-based analytics (p. mining)



Taiwan Tech, IM Dept, e-Business Lab.

# Modeling Methods in This Course

- \* BPMN
- \* Petri-Net

27

Taiwan Tech, IM Dept, e-Business Lab.

# BPMN

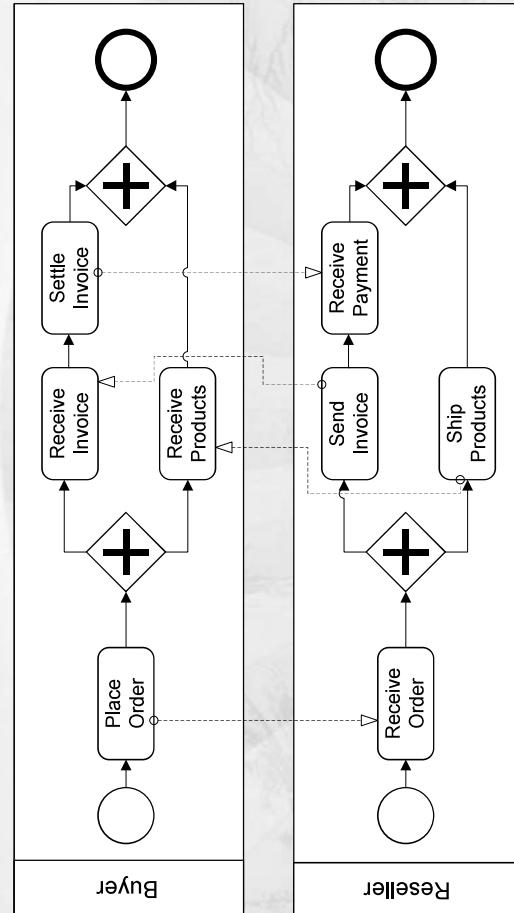


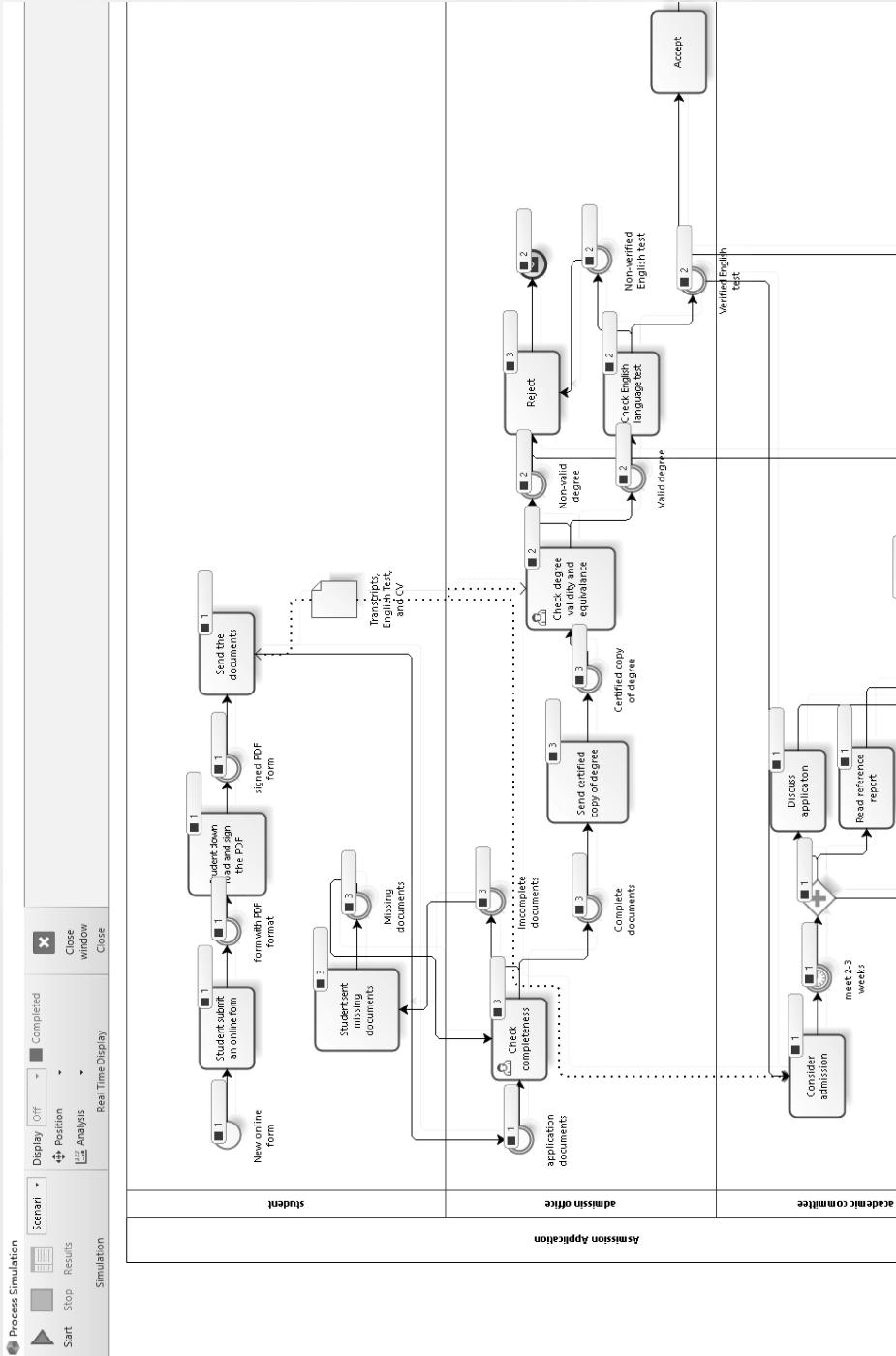
Fig 1.3. Interacting business processes form process choreography

Taiwan Tech, IM Dept, e-Business Lab.

© Springer-Verlag Berlin Heidelberg 2007  
M. Weske: Business Process Management

28

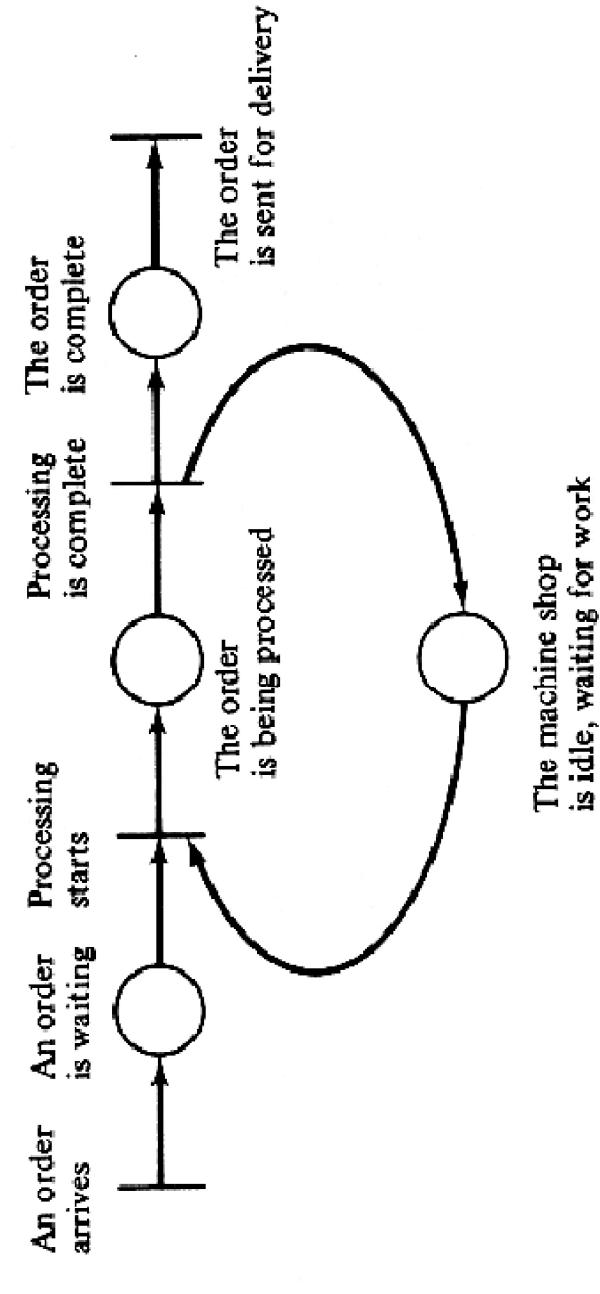
Taiwan Tech, IM Dept, e-Business Lab.



29

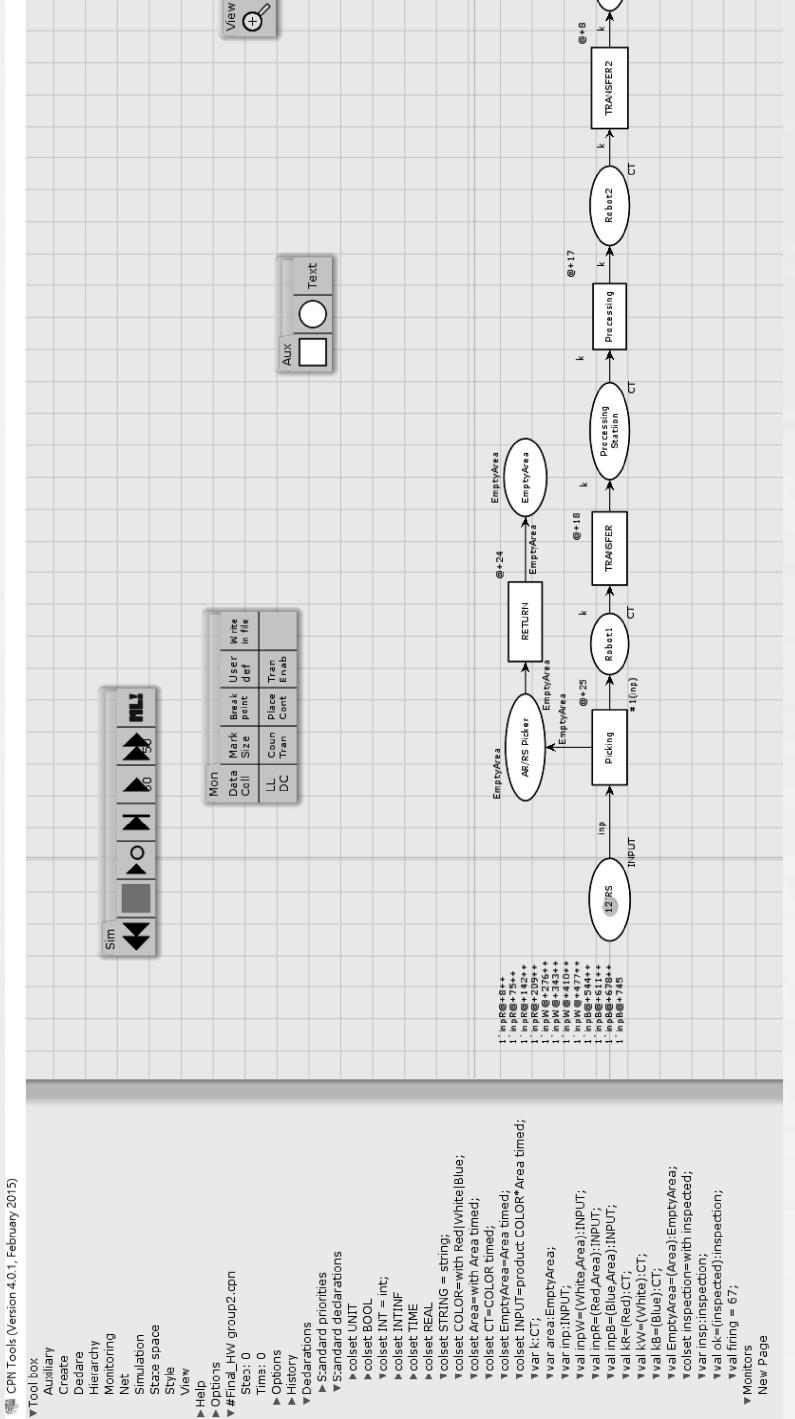
Taiwan Tech, IM Dept, e-Business Lab.

# Petri-Net



Taiwan Tech, IM Dept, e-Business Lab.

30



Taiwan Tech, IM Dept. e-Business Lab.

# Exercise CVS Pharmacy

- \* Please read the CVS Pharmacy case in p.28-p.29 and answer the related questions.
  - \* Please model the pharmacy process