**Course:** Software Methodologies

# Read " Lecture Notes. Part 2" according to the following questions:
## Questions

1) What is the purpose of ontologies in enterprise engineering?
2) What are the purposes of IEM?
3) Describe the IE hierarchy.
4) What is a business function and what is its relation to existing organizational structures?
5) Enumerate the main business process subclasses.
6) Enumerate the artifacts produced by business models.
7) What are the two evolution threads in information engineering methodology (IEM)?
8) What are the stages in IE?
9) What must an enterprise model represent from an operational point of view?
10) What is the difference between the dictionary and encyclopedia in IE?
11) Enumerate the enterprise engineering types and briefly describe them.
12) Enumerate the main business components.
13) For a chosen enterprise map the enterprise organigram and specify the business functions.
14) Describe the architectures produced by business process engineering.
15) Enumerate and briefly explain the six IE principles.
16) Compare the approaches towards changing of a business.
17) What triggers business behaviors?
18) How to document a business?
19) What means "Mapping activities to agents" and "Mapping events to business entities"?
20) What are the main components of an activity diagram?
21) Explain the action semantics in UML.
22) Produce the activity diagram for registering to a master course. Identify parallel activities. Use accept event actions and send signal actions.
23) Produce the activity diagram for an industrial process you are familiar with. Use "swim lanes" and object flows. Give a textual definition of the business process, identifying the inputs and the outputs.
24) Produce the business domain model for a tourist agency offering touristic packages abroad. Enumerate the business actors and their roles, business rules and business objects. Name the associations between the domain model artifacts.

## Exercises

1. LIS corporation acts as book-jobber. Its business consists of the followings activities:
   - receive orders from librarians for books about computers,
   - order the books from the appropriate publisher, at a discount, and
   - fill the order on receipt of the books from the publisher.
   - produce invoices by a service bureau computer from forms filled out by LIS staff.

   a) Identify the enterprise functions. Propose an organigram of the LIS enterprise. Map the enterprise the organizational units of the organigram into the business functions.
   b) Draw the business use case diagram.
   c) Identify the enterprise business objects.
   d) Identify the enterprise business agents
   e) Draw the activity diagram for the book-jobber business process.

**Hint**. You are the systems analyst has been assigned to investigate and model the LIS business. Try to consolidate your understanding on the LIS business by interviews with the stakeholders (in our case, imagine how the company may work) and extend the problem statement sufficiently to draw a business model draft from it

2. XYZ is a company which provides metropolitan internet services to its customers. When service subscription requests arrive at the company they are processed and approved, and invoices for all active subscriptions are printed and dispatched to customers. Because employees lament their bureaucratic style work, management decides to enforce the use of IT and with a BPI-oriented process introduces an information system for document workflow management to offer an easier access for customers, reduce the use of paper, speed up processing and approving procedures, and tune and better control the whole process.

The following scenario describes a simplified subscription approval workflow which monitors the status of documents and automatically routes them to the appropriate person(s) based upon pre-defined rules and process flows. In addition to automated routing, users have the ability to route documents on an ad hoc basis, if needed.

A customer can submit a subscription request using a web interface where he/she should insert personal data (name, home address, personal identification code, e-mail address etc.) and services he/she wants (TV, internet connection etc.).

When a new service subscription request arrives in company it is registered in a unique location, automatically assigns it (i.e. access right is given) to an available worker in Subscriptions Division for data verification and finally notifies him/her. The worker selects the subscription request, checks it and cancels, denies, or accepts the request by clicking an appropriate button on the graphical interface. According to the worker's choice the system initiates the appropriate transition - to cancel, deny or respectively to route the request to the subscriptions manager. It may be necessary to route the document to multiple other workers for processing before submission to the subscriptions manager (by giving access and notifying them). If the operator were out sick that day, a timer, (a monitoring process running on the workflow server) automatically reassigns the subscription document to another operator.

When the subscription request makes the transition to the subscriptions manager the document waits until the manager selects it from other documents that wait for tariff assignment. Selection done, the approval operation begins. When the subscriptions manager inputs the subscription tariff, the system checks to see if technical conditions exist to deliver the service at the subscriber address. If some technical conditions are not verified, the request is notified and made available to the Installation Division where it will wait until all technical conditions are fulfilled. Otherwise, the system automatically routes the request to Accounting Division for service activation. To carry out the needed technical review work an electrician belonging to the Installation Division selects the subscription request from other documents. When the electrician reports completion of the technical review, the system automatically routes the request to Accounting Division for service activation. When the services were activated, an e-mail notification is sent to the customer.

Billing automatically begins a week before the last day of any month. In order to compute the due amount the system uses an algorithm corresponding to the tariff associated to the subscription. This algorithm mainly uses the number of days of service supplying, daily cost and TVA, but other parameters can be also considered. The invoices are sent by e-mail to customers. After payment invoices are archived.

1. Partition the business in automatizable components  by identifying their needed interfaces.
2. Identify the main business objects and their relationships.
3. Identify the business agents.
4. Identify the process flow.
5. Draw the activity diagram of the subscription business process.