Course: Software Development Methods.
Prof. Luca Dan Serbanati
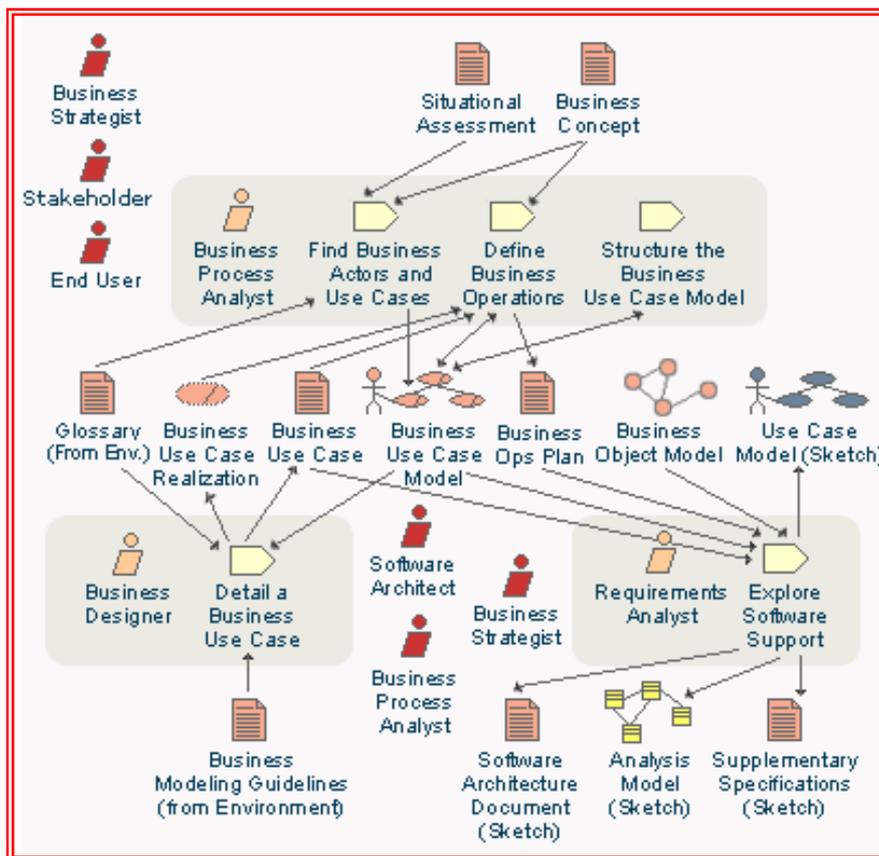**Conf. Andrei Vasilateanu**

GUIDELINES FOR LABORATORY AND PROJECT ACTIVITY

HW1. Business Analysis and Modeling,

Deliveries: Business Model

FIRST MACRO-ACTIVITY: BUSINESS SYSTEM ANALYSIS AND MODELING

In the following figure the main elements of a business system project development are presented.

To analyze and model a business system, its main components should be first identified and described:

1. Business Actors (mainly Customer)
2. Business Processes[1] (Operations, Activities)

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[1] A **business process** is a collection of related structural activities that produce something of **value** to the organization, its stakeholders or its customers. It is, for example, the process through which an organization

3. Business Agents
4. Business Objects
5. Business Rules

Have in mind the following procedure to be applied:

1. Define the scope of the business process modeling effort (business domain)
2. Define business processes based on agreed priorities
3. Explore where software can automate, enable, or enhance business processes and understand at a high level how new system/s could relate to existing systems and technical infrastructure
4. Review and refine resulting business operations design

1. In order to identify the business system components, answer to the following questions regarding the business system of the "E-Film Hiring" system:
    i. Which are the business actors that interact with the business system and which are their concerns/interests regarding the system?
    ii. What is the value produced by the business? (mainly for its actors)
    iii. What business processes have place in the business system?
    iv. Which are the business agents that work in the business system?
    v. What resources the agents use when they execute the business processes?
    vi. What are the business activities that could be automated by including new hardware and software components?
    vii. What are the business objects used by and/or obtained after the execution of software components?

2. Construct the **Business Use Case Model** of the business system.
The Business Use Case Model is composed of:
- use case diagrams illustrating the scope of the business being modeled. The diagrams contain business actors (roles played by organizations, people, or systems external to the business) and functions (business processes and their sub-processes) they request to the business.
- use case descriptions where each business use case is described with its characteristics: name, brief description, preconditions, workflow (successful scenarios and alternatives), non-functional requirements, etc.
For this, identify business actors and then business processes. Briefly describe first and then detail each business process. When the description is sufficiently complete, try to describe the business process workflow with a UML activity diagram. Verify that all possible scenarios are included in the diagram.

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realizes its services to its customers. Each business process has inputs, method (transformation, transaction) and outputs. The inputs are a pre-requisite that must be in place before the method can be put into practice. When the method is applied to the inputs, then certain outputs will be created. A business process can be part of a larger, encompassing process and can include other business processes that have to be included in its method. In that context a business process can be viewed at various levels of granularity. The linkage of business process with value generation leads some practitioners to view business processes as the workflows. This is why the BPMN diagrams are a valuable conceptual tool for the business and its embedded processes description.

3. Describe the business and its processes using BPMN diagrams (processes or orchestration, collaborations, choreographies, etc.).
4. Construct the **Business Domain Model** of the business system.

The Business Domain Model is a representation of meaningful real-world concepts pertinent to the domain that need to be modeled in software. The concepts include the entities involved in the business and rules the business uses in relation to these entities. It is represented as a class diagram that shows the system resources: main business objects and business agents, and their interactions. Another term for business class diagram is *robustness diagram*. The model can be used to solve problems related to the business domain.

In broad terms, the Business Problem Domain describes the area undergoing the software system environment analysis.

5. Construct the **Business Sequence Diagram**. It describes the interactions between business actors and your business. Identify the main business operations (the operations that trigger business processes).

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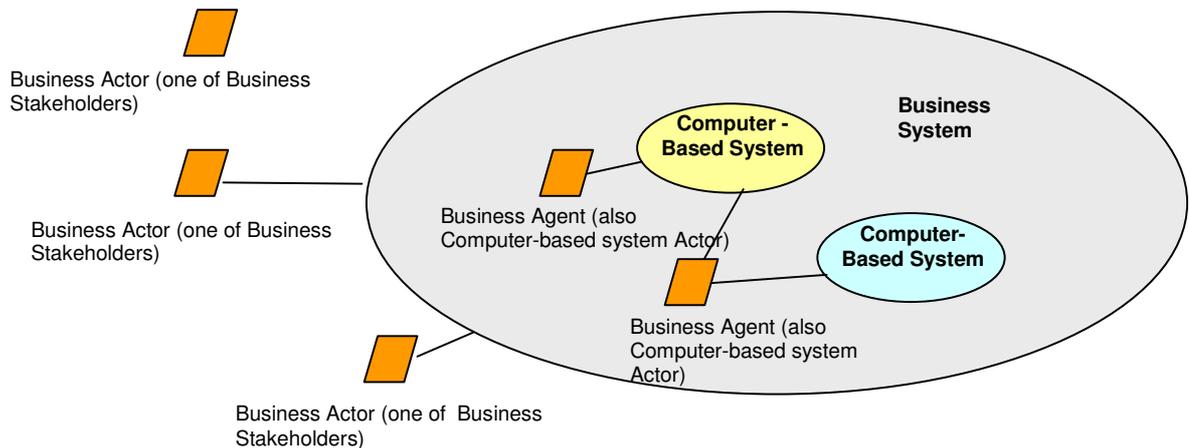# GUIDELINES FOR LABORATORY AND PROJECT ACTIVITY

HW2. User Requirements Analysis

Deliveries: Use Case Model

SECOND MACRO-ACTIVITY: USER REQUIREMENTS ANALYSIS
First Step: Building Use Case Model

The following figure shows the relationships between the stakeholders, the business system, and its internal computer-based systems.

1. Define the computer-based system boundary and construct the context diagram of the computer-based system. In order to do this, follow the next steps:

   a. Write the system description consisting of one or two phrases which provide a general, concise description of the system.
   b. Identify the non-developers stakeholders in the business system who are interested in a computer-based system solution. Most of them become the actors of the computer-based system. Describe their objectives and interests.
   c. Delineate the problem domain and implicitly the boundary of the computer-based system.
   d. Identify the primary actors and the computer-based system events they trigger.

2. During this interaction a primary actor generates events to the system, usually requesting some operation in response. For the purposes of software development,

the system boundary is usually chosen to be the software (and possibly hardware) system itself; in this context, a system event is an external event that directly stimulates the software. Document the system events in the System Event List. It may contain three event types: data flow, temporal and control. System events should be expressed at the level of intent rather than in terms of the physical input medium or interface widget level.

3. Construct the Requirements Document like a **Use Case Model**[2]. In order to do this, follow the next steps:

   a. From the stakeholder objectives identify the use cases the system should implement. These use cases specify the system functions deduced from the stakeholders' concerns and system events. A function of the system should follow the following pattern:

      "The system has to do/execute/produce/provide/memorize/store…"

   b. Describe each use case using the use case template provided at the course. Warning: include both the main and alternative flows.

   c. Add for each use case description the quality attributes you extract from the stakeholders' objectives: portability, robustness, usability, performances, software or hardware platform on which the system will have to execute, so on.

   d. Draw the software use case diagram.

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[2] The Use Case Model is composed from a diagram illustrating the scope of the application being built and use case descriptions. The diagram contains actors (roles played by people or systems external to the application being built) and uses cases that is the services or functions the actors request from the application.
Do not confuse Business Use Case Model with the Use Case model! A single Business Use Case Model may have many (system) Use Case Models associated with it, where each Use Case Model represents a single computer-based application.