System Analysis and Design

(IT3120E)

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<u>Content:</u>

- Introduction of object-oriented system analysis and design

- Introduction of the modeling language UML

- Introduction of software development process

- **Analysis of the environment and needs**

- Function analysis

- Structure analysis

- Interaction analysis

- Behavior analysis

- Design of the system's overall architecture

- Class detail design

- User interface design

- Data design

Analysis of the environment and needs

- Goal of the analysis

- Method of the analysis

- Create the system overview document

- Project planning

Goal of the analysis

- This is the preliminary study step

- Investigate and study about the environment and business context of the system to be built

- Identify functional and non-functional requirements, risks and constraints

- Project definition and planning

- Question to be answered: "Should we develop or give up the project?"

Method of the analysis (1)

Investigate, survey in several different ways:

- ❑ Studying written materials
  - ◼ Complete documents
    - ❑ Transaction documents
    - ❑ Archive documents (papers, files)
    - ❑ Reporting documents (plan, statistics)
  - ◼ Fill-in documents
    - ❑ Inquiry documents (questionnaire, collection form)

Method of the analysis (2)

❑ Interviewing

- Interview with written materials to explain/add/check/update written information

- Interview without written materials: seminar, individual/group interview

- Survey form with open/closed questions

❑ Observing

- Work execution process, Business document processing flow, etc.

- Count the number of transactions, count the processing time, etc.

Create the system overview document (1)

- Aggregate the studied and collected information into an overview report of the system

- Each system is always placed in a business environment. At this stage, it is not possible to clearly determine the boundary between the system to be built and the environment

- Describe the operation of users, equipment and computers in a business environment

Create the system overview document (2)

- The system overview document should include:
  - Business goal
  - Main tasks/main functions
  - Business processes
    - Should be described (presented) by activity diagrams
  - Types of information used in the system
  - Requirements for the system to be built:
    - About functions,
    - About quality, performance, etc.
    - About priorities, restrictions, constraints

Project planning

- Define the scope and limitations of the project

- Define the goals and priorities of the project

- Propose a solution (at a general/preliminary level) and demonstrate its feasibility

- Anticipate and assess risks (e.g., misunderstanding needs, outdated technology, limited human resources and experience, limited time to complete, etc.)

- Create the project's implementation plan (human resource, finance, timetable, considering risks, etc.)