Deliverable 2: Requirements Specification

ITS400/CSS400 Project Development (Semester 1)

http://ict.siit.tu.ac.th/moodle/

Project Stages

• Project Concept	why do it?
• Requirements Specification	what will it do?
• Design Specification	how will it do it?
• Implement	do it
• Test	did it do it?
• System Manual	how did you do it?

Requirements Specification

- List the things that your system must do
- Purpose:
  - Force you to think about features
  - Clients clear on what you will do
  - You clear on what the client expects
  - Act as a contract between you and client

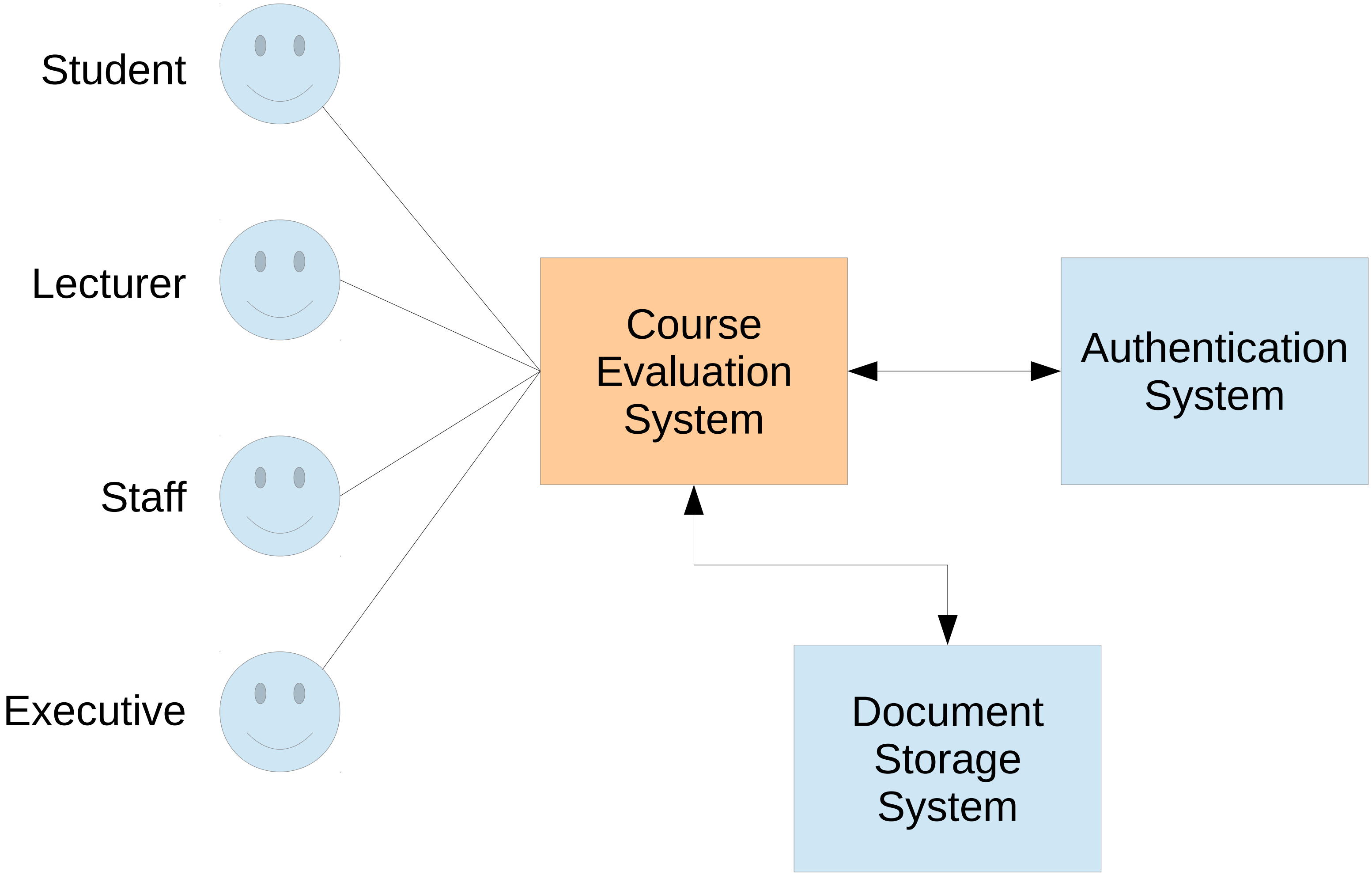
Sections

- System Description
  - Perspective
  - Functions
- Interface Requirements
- Functional Requirements
- Performance Requirements
- Design Constraints
- Non-Functional Requirements (or System Attributes)

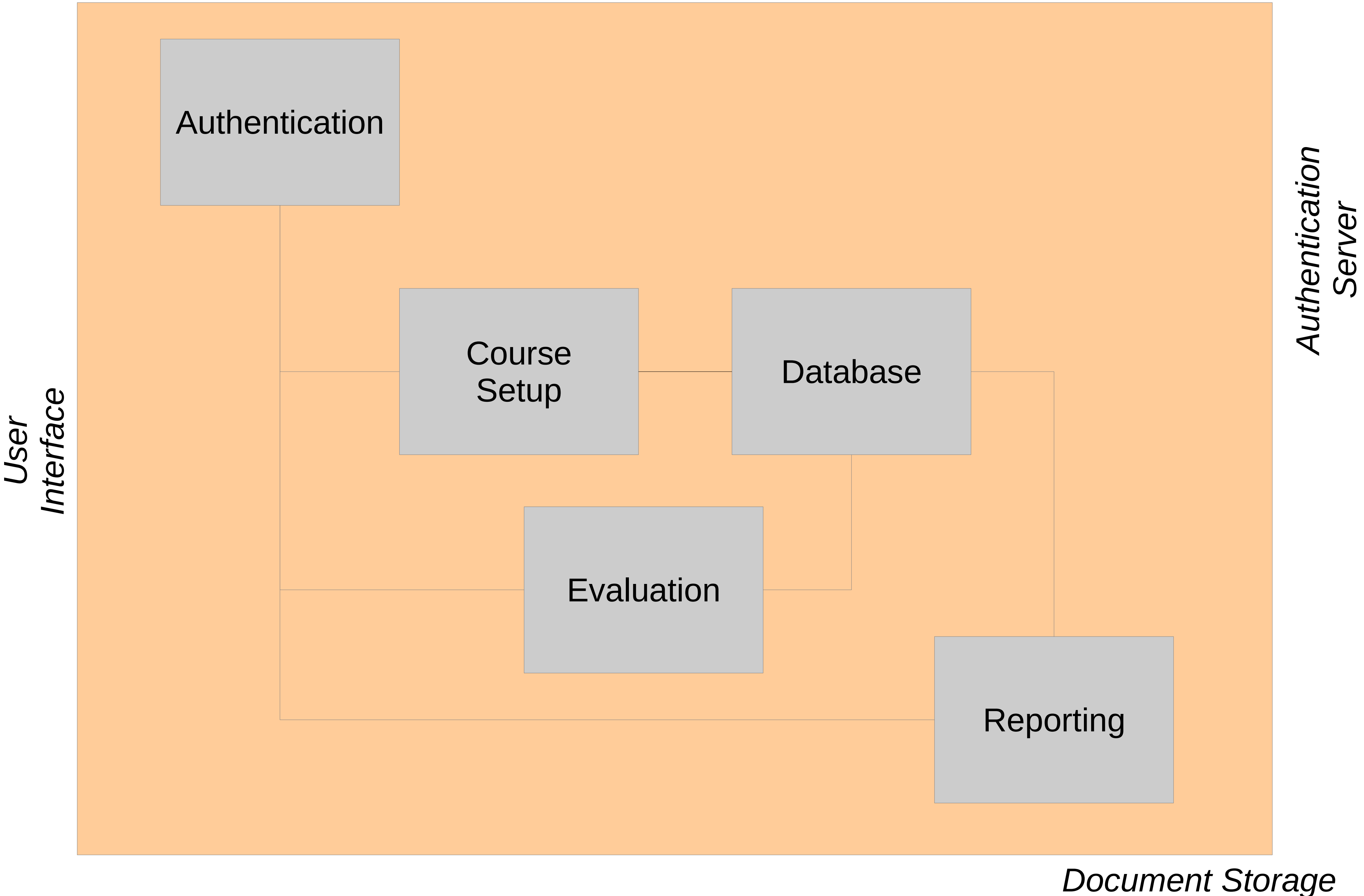
System Description

- Brief description of your system (1-3 paragraphs)
- Perspective
  - How does your system relate/interface with other systems and users
  - Block diagram showing your system as a block and:
    - Blocks for other systems
    - Users
    - Links between blocks
- Functions
  - List the main functions/features of your system
  - Block diagram showing the functions

Perspective Block Diagram



Function Block Diagram



Authentication

Course Setup

Database

Evaluation

Reporting

User Interface

Authentication Server

Document Storage

Interface Requirements

- How does your system interface with other systems/users?
- External interfaces only
- Optionally may divide into sub-sections, such as:
  - User interfaces
  - Hardware interfaces
  - Software interfaces
  - Communication interfaces
- May use diagrams

Interface Requirement 1

- IR1: The system must interface with the Authentication System.
- IR2: The following messages sent to the Authentication System must be supported:
  - DoesUserExist
  - IsPasswordCorrect
- IR3: The following messages sent from the Authentication System must be supported:
  - UserResponse
  - PasswordResponse

Functional Requirements

- What will the functions/features do?
- Longest list of requirements, most important
- Split into sub-sections based on functions/features
  - E.g. Authentication, Course Setup, Evaluation, ...

Ranking Requirements

- Must (or Shall) REQUIRED
  - If not met, you fail

- Should DESIRABLE
  - If not met, you need a good reason

- May OPTIONAL
  - If is met, then you get extra points

Numbering Requirements

- Ensure individual requirements can be easily referenced

Req 1
Req 2
Req 3
...
Req 47

Req 1.1
Req 1.2
Req 1.3
Req 2.1
Req 2.2
...
Req 13.7

IR 1
IR 2
...
FR 1
FR 2
FR 3
...
PR 1
PR 2
...

Interface Req
Feature Req
Performance Req

Functional Requirement 1

- Function: Evaluation
- Eval 1. The system must automatically fill in the students name in the evaluation form.
- Eval 2. The system must allow the staff to define the names and number of scores for the evaluation.
  - Rationale: some evaluations may use a scale of “1, 2, 3, 4, 5”, while others may use “Fair, Good, Excellent”. The staff should be able to change the scale.

Functional Requirement 2

- Function: Reporting
- Report 1. The system must be able to group data into the following data sets grouped by:
  - Semester
  - School
  - Program
- Report 2. The system must calculate the following statistics for any data set:
  - Mean, stdev, min, max, Q1, Q2, Q3

Functional Requirement 3

- Function: Database
- DB 1. The database must be able to store the information in Tables 1, 2 and 3.
  - Then include the tables.

Using Diagrams

- You may use diagrams and other structures in requirements
  - tables, lists, block diagrams, data structures, flow diagrams, UML, ...
- If you include a diagram give it a caption (e.g. “Table 1)” AND ensure it is referred to by a requirement

Performance Requirements

- Not everyone will have them
  - “There are no performance requirements of our system.”
- Measurable, verifiable
  - Speed: response time, queries per second, screen refresh time, ...
  - Size: Bytes consumed on disk or RAM, number of parallel connections supported
  - Reliability: mean time to failure, probability of unavailability
  - ...

Performance Requirement 1

- Example: a server for an embedded system
- *PR 1. The compiled executable for the server must be small.*
  - BAD
  - What is small?
- *PR 1. The compiled executable for the server must be less than 100KB.*
  - GOOD
  - Can check if requirement is met

Design Constraints

- What constraints are imposed by standards and other external factors?
- Not everyone will have them
  - “There are no design constraints of our system.”
- Constrains imposed by:
  - standards
  - laws/regulations
  - auditing

Design Constraint 1

- Example: application that reports financial info
- *DC 1. The application must output financial transaction records in the format specified by Standard 1234.*
  - The format is constrained by a government standard

Non-Functional Requirements

- Also called “System Attributes”
  - Reliability, maintainability, security, availability, portability, business requirements, ...
- Only list the requirements relevant to your system
- May be hard to distinguish between functional, performance and non-functional requirements

Non-Functional Requirement 1

- Example: application must work on different hardware/OS
- NFR 1. The system must execute on Windows 10 and Linux kernel 3.13
- NFR 2. The system must execute on 64-bit OS
- NFR 3. The system may execute on 32-bit OS

Writing Requirements is Hard

- Hard to extract all requirements from client in advance
- Hard to write clear, unambigious requirements
- Hard to predict performance requirements
- Hard to distinguish between interface, functional, and non-functional requirements

Expectations for Project Development

- Not so important
  - Putting requirements in correct section
  - Accurately predicting performance requirements
  - Knowing design constraints and non-functional requirements
  - Consistency, avoiding ambiguity

Expectations for Project Development

- Important
  - System Description
  - Functional requirements
  - Interface requirements
  - Listing as many real requirements as possible

How big is the requirements specification?

• System Description	
– Perspective	Block diagram(s) and several paragraphs, lists
– Functions	
• Interface Requirements	Several
• Functional Requirements	10's
• Performance Requirements	0+
• Design Constraints	0+
• Non-functional Requirements	Several

Deadlines

- Deliverable 2: Requirements Specification
  - Submit draft by midterm exams
  - Submit final version by final exams (20%)
  - Finalised in 1st week of semester 2

Presentation 2: Mockup

  - After mid-term
  - Prototype or pictures of what your system will do
  - Provide feedback to improve requirements

Next ...

- Groups BS to NH go to Network Lab
- Groups PA to VS go to IT Lab
- In your groups start writing some requirements
- Submit on SVN by 4pm today
  - Does not need to be complete