University of
South Australia

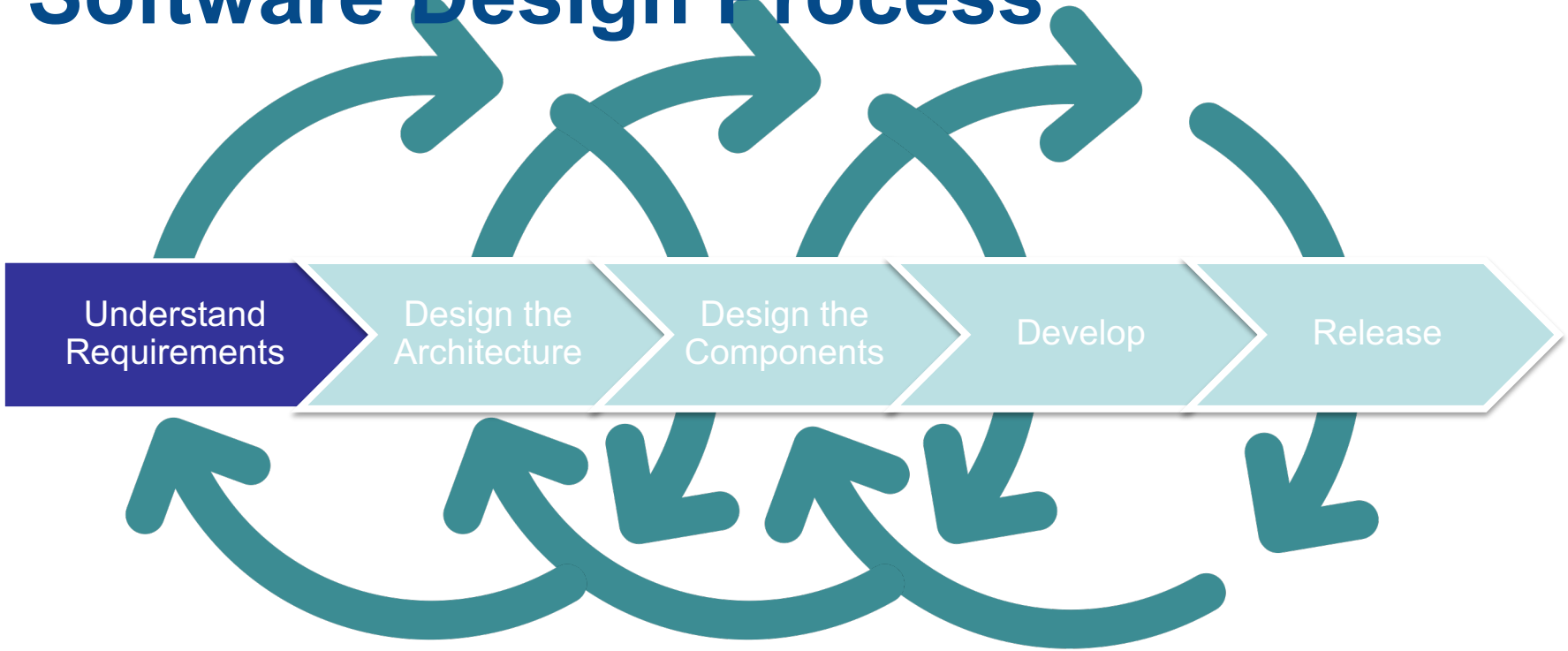
INFS 2044

Workshop 1a

Preparation Already Done

- Revise SMART and FURPS+ topics from INFS1026 System Requirements and User Experience
- Bring a copy of the workshop instructions (this document) to the workshop

Software Design Process



Learning Objectives

- Identify deficient requirements and improve them
- Assess the completeness of a domain model
- Assess the completeness of a use case list

Task 1. Requirements Review

- Requirements form the basis for design
- How do we know we have good requirements?
- What are the properties of good requirements?
- What can we do to check?

S.M.A.R.T.

- Specific
- Measurable
- Achievable
- Realisable
- Traceable

Requirements Example

- R01: The system shall process payments.

Requirements Example

- R02: The system shall be fast.

Requirements Example

- R03: The system shall be compatible with every accounting system.

Requirements Example

- R04: The system shall respond to each request in no more than 1 ps.

Requirements Example

- R05: The cashiers should be friendly.

Requirements Example

- The system shall be no heavier than 0.2kg.

Requirements Example

- R07: The system shall cost no more than AUD 2,000.

Requirements Example

- R08: The system shall have a *Payment* module.

Requirements Completeness

- How do we know that we have captured all requirements?
- We cannot be sure
- Experience with similar systems can help
- Thinking about the different aspects of system requirements can help identify what may have been missed

FURPS+

- Function
- Usability
- Reliability
- Performance
- Security
- +: Design constraints, implementation-, interface-, physical-, and supportability requirements

Examples of requirements

1. … calculate taxes based on country-specific rules.
2. … display readable by normal-sighted persons at 1 meter distance
3. … respond to user input in no more than 0.2 seconds.
4. … continue processing sales if network unavailable.
5. … be unavailable for no more that 1 hour per week.
6. … under normal conditions process each message in no more than 1 second.

Examples of requirements

7. … process no less than 100 requests per second.
8. … securely transmit data in flight.
9. … limit access to services to authenticated and authorized users.
10. … expire user sessions after 5 minutes of inactivity.
11. … includes only company-approved software.
12. … implemented in Python.
13. … enable configuration of business rules.

Review a Use Case: NFRs

- Review the use case *Make Booking.*
- Identify non-functional requirements pertaining to this use case.

Use Case UC01: Make Booking

1. *User enters date range.*
2. *System presents available rooms, their descriptions, and daily rates.*
3. *User selects room.*
4. *System presents total price.*
5. *User enters contact details and payment details.*
6. *System verifies payment, records payment confirmation, and issues booking confirmation.*

Task 2. Review Domain Model

- How do we know if the domain model is correct?
- Replay the use case narratives on the domain model to see if the model includes all concepts, attributes, and relationships required by the use case.
- Any missed elements indicate that the domain model may be incomplete.

Review Model for Room Booking

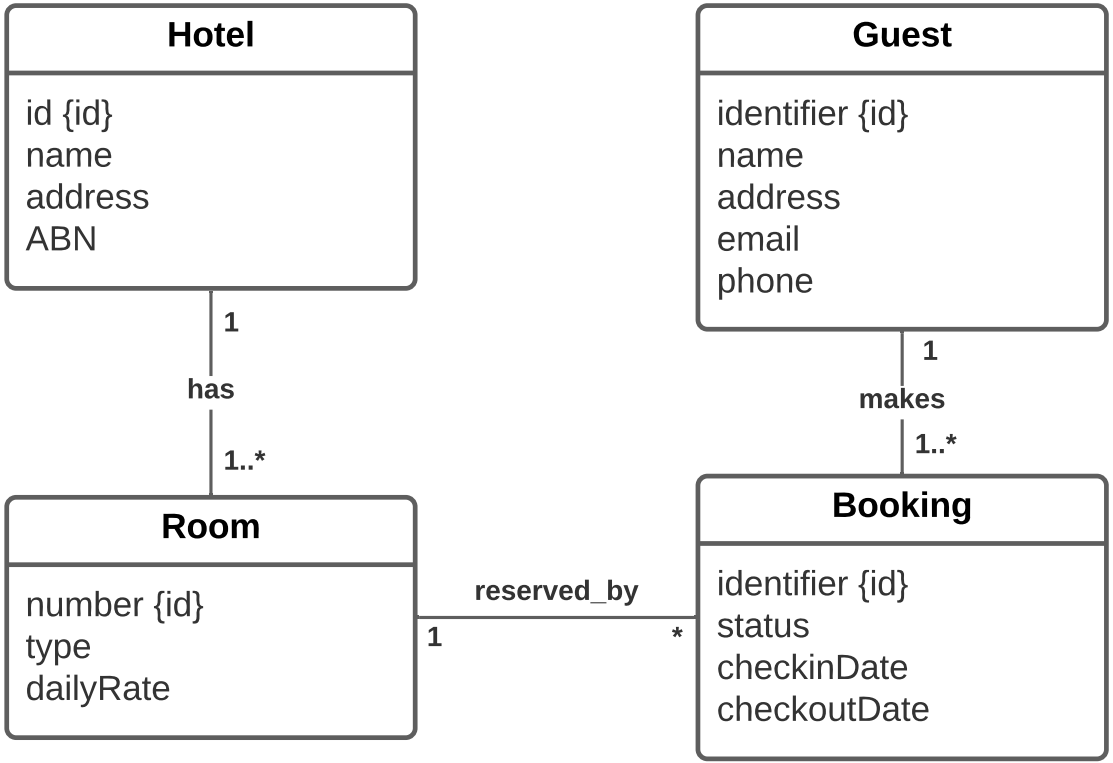
- Simulate the use case narrative for the *Make Booking* on the Domain Model.

- Does the domain model capture all relevant concepts, attributes, and relationships that are needed for simulating the use case narrative?
- If not, what has been missed?

Use Case UC01: Make Booking

1. *User enters date range.*
2. *System presents available rooms, their descriptions, and daily rates.*
3. *User selects room.*
4. *System presents total price.*
5. *User enters contact details and payment details.*
6. *System verifies payment, records payment confirmation, and issues booking confirmation.*

Room Booking Domain Model



Amend the Domain Model

- Add the missed elements to the domain model.

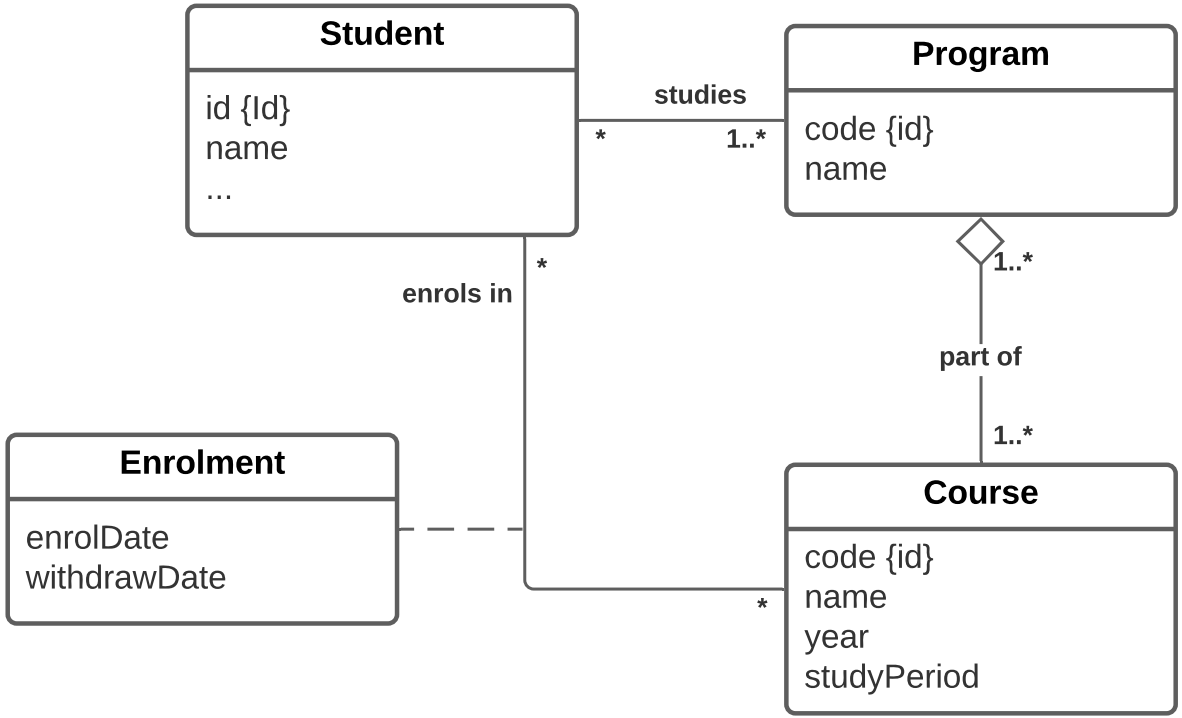
Task 3: CRUD Analysis

- A technique for identifying missing use cases
- Compare expected operations on domain model with actual operations carried out in use cases
- Identified omissions may indicate missed use cases

Enrolment System: Use Cases

- Suppose two use cases were identified
  - Search Courses
  - Enrol in Course

Enrolment System: Domain Model



Enrolment System: CRUD Table

	Student	Program	Course	Enrolment
Search Courses		R	R	
Enrol in Course	R		R	C

Enrolment System: CRUD Analysis

	Student	Program	Course	Enrolment
Search Courses		R	R	
Enrol in Course	R		R	C

- Enrolments can only be created
- Should the system be able to
  - Read enrolments (Use case “List enrolled courses”)
  - Update enrolments (Use case “Change enrolment”)
  - Delete enrolments (Use case “Withdraw from Course”)
  - Add/modify/delete Students, Programs, Courses, etc??

CRUD Analysis for Booking System

- Tabulate the CRUD operations that each use case carries out on the relevant elements in the domain model.
- Make reasonable assumptions where the use case narrative is not given.

Booking System: Use Cases

Identifier	Use Case Name
UC01	Make Booking
UC02	Edit Booking
UC03	View Bookings
UC04	Find Hotel
UC05	Find Rooms

You Should Know

- Identify poor requirements using SMART
- Identify missed requirements using FURPS+
- Validate domain models by replaying use cases
- Validate use cases using CRUD

Activities this Week

- Attend second Workshop session
- Complete Quiz 1

University of
South Australia