PXL – Digital
42TIN280 Software Analysis - System & System Context – Business Use Cases

Week 04 – semester 01

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  - Modeling notation
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UML = Unified Modeling Language

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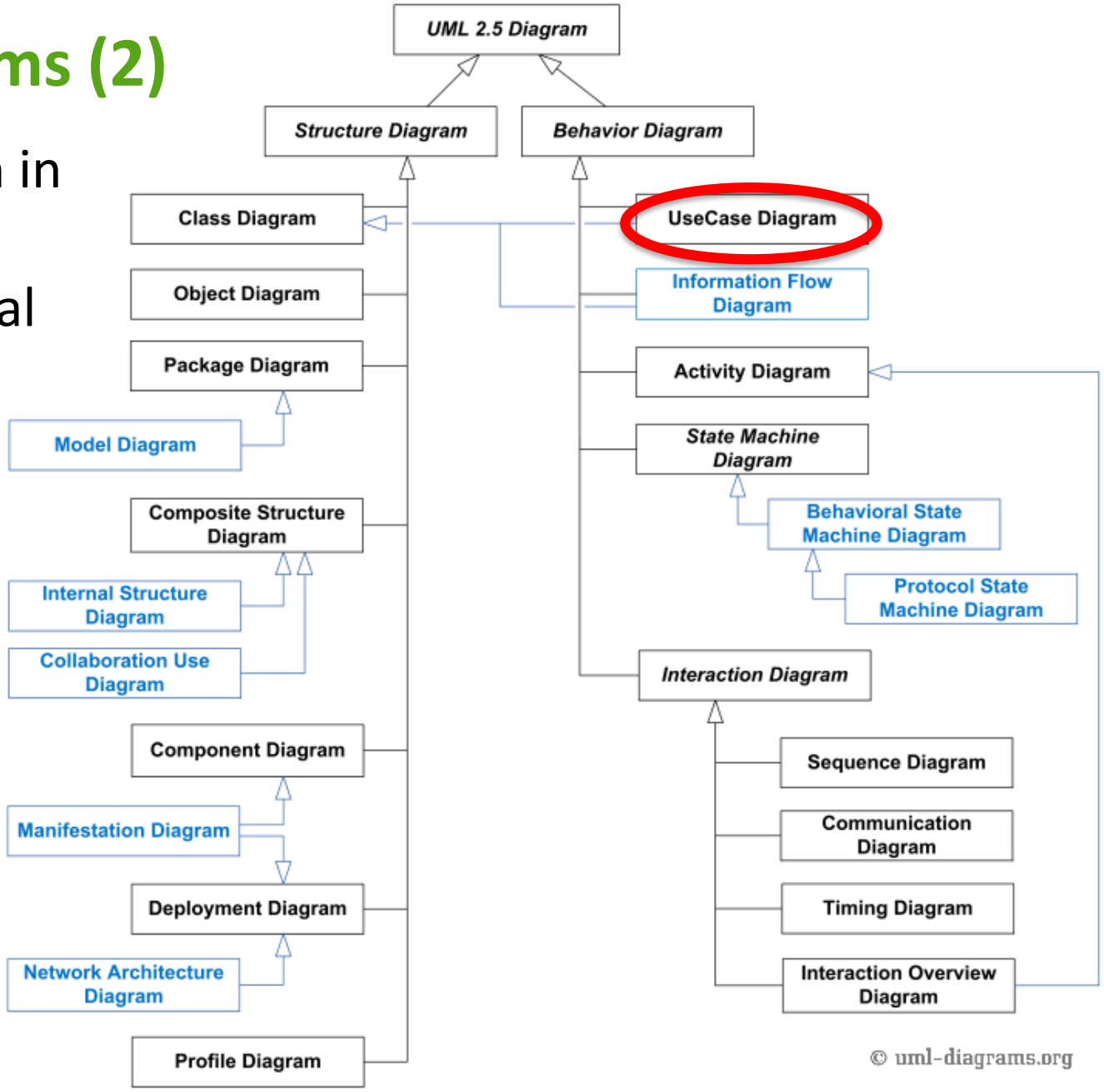
  General-purpose, developmental, modeling language in the field of software engineering, that is intended to provide a standard way to visualize the design of a system

- Is NOT a method
- Typically: UML models are graphical representations (= diagrams) of certain aspects of the information system
- https://en.wikipedia.org/wiki/Unified_Modeling_Language
  - 1997: version 1.0
  - Now: version 2.5, officially released in June 2015

UML diagrams (2)

- Items shown in blue are not part of official UML 2.5 taxonomy of diagrams.



UML remarks for business modeling (1)

- Goal UML ➔ support for business modeling
- Although UML specification provides no notation specific to business needs (cf. last bullet in red)
- BUCs introduced in RUP to represent business function, process, or activity performed in the modeled business
- Business actor: role played by some person or system external to modeled business, and interacting with business
- BUC should produce result of observable value to business actor
- **BUC as well as business actor are not defined in UML standard, so …**
  - **Use some UML tool supporting those or …**
  - **Create your own business modeling stereotypes.**

Why & when business use case models?

- For simple business situations
  - context diagram can be good enough to model relevant business context

- When this not sufficient, then analyst further investigate business context by using
  - business use case model or
  - business process model (cf. 3SWM olod BPM)

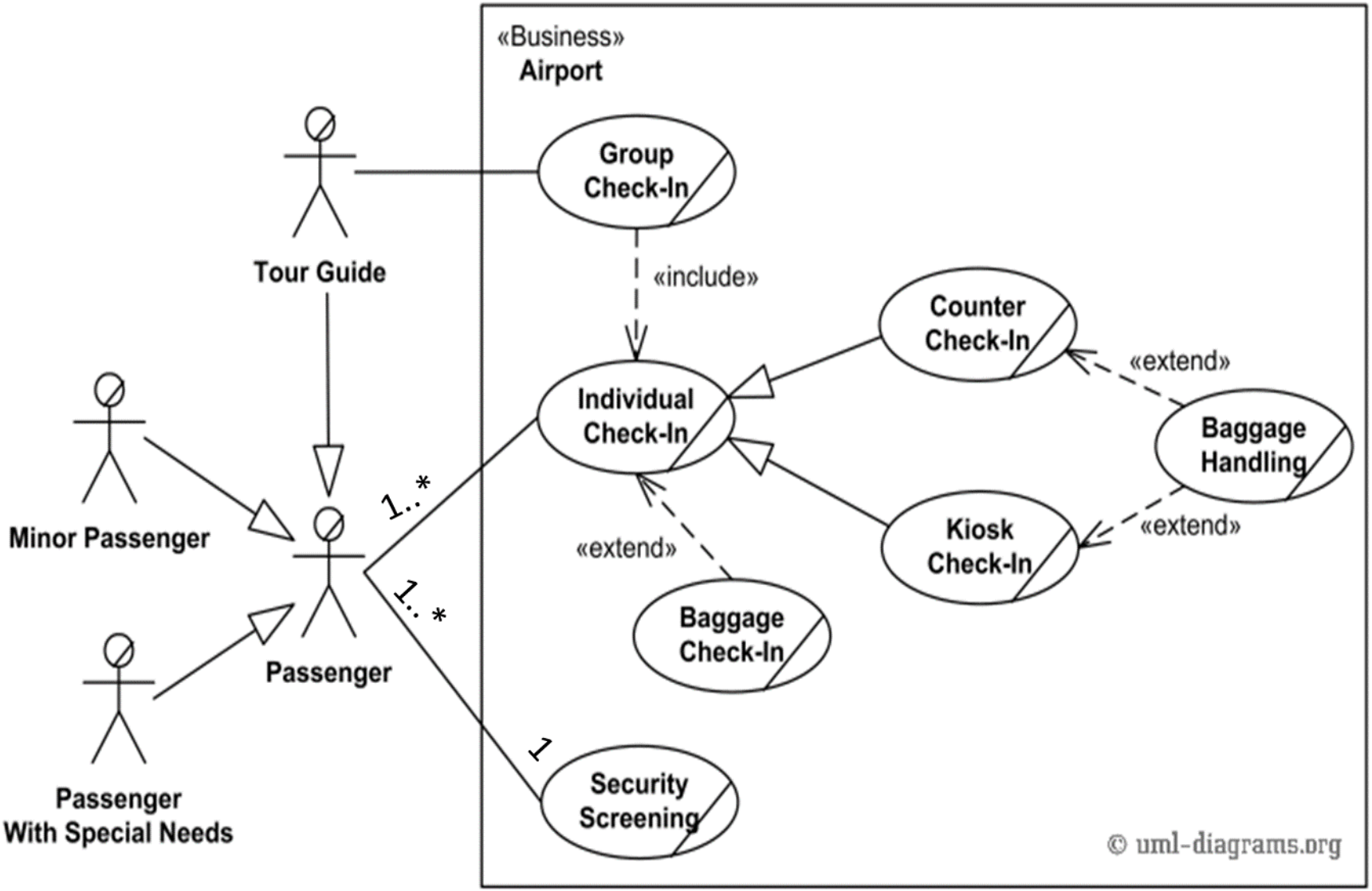
Business versus system use case

- A ***business use case*** is a way in which a **customer** or some other interested **party** can make use of the **business** to get the result they want whether it's to buy an item, to get a new driving license, to pay an invoice, or whatever. An important point is that a single execution of a business use-case should **encompass all** the **activities necessary** to do what the customer (or other actor) wants, and also any activities that the business needs to do before the process is complete from its point of view.

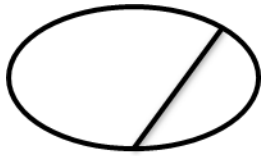
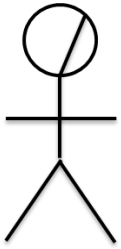
Business versus system use case

- A ***system use case*** is a way in which a **user** of a **computer** system can **make use** of the **system** to get the result they want. This will typically be something we can readily imagine as being done in a single sitting on a single PC or other device such as an ATM or a mobile/cell phone, usually with a single UI, or a small number of closely-related screens such as a wizard, and taking maybe between a couple of minutes and a half-hour at most.

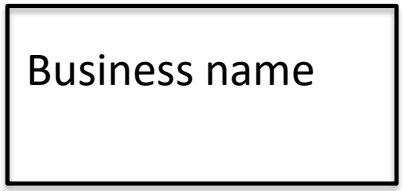
BUC – What do you see? Notation?



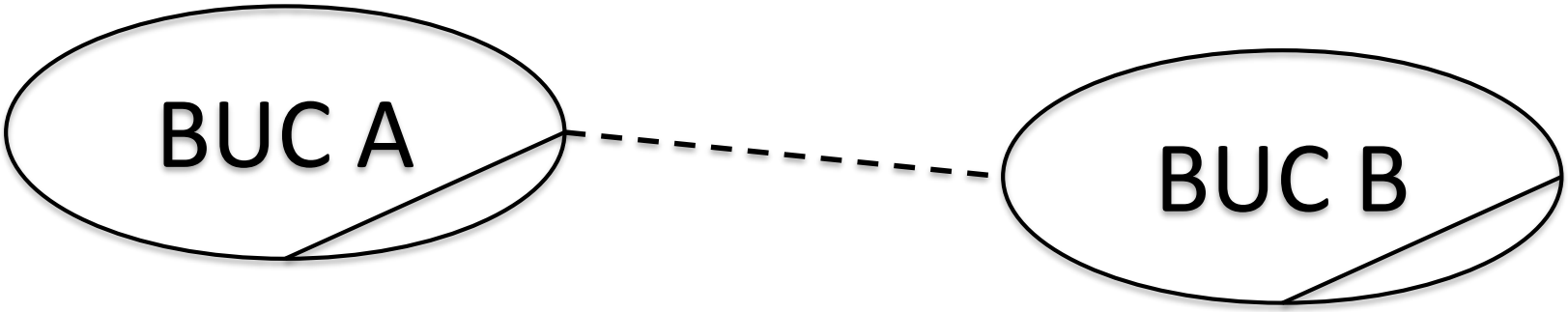
BUC – What do you see? Notation?

 Business use case	Describes one **business process** as a sequence of (inter)actions between a business actor and a worker as a whole to fulfill a goal of the business actor. (e.g., manual payment processing, expense report approval, manage corporate real estate.) The business use case will describe a process that provides **value to the business actor**, and it describes **what the process does**. Granularity: document one business use case for every individual business event !!!!!
 Busines actor	A business actor represents a business role (customer, order intaker,...) that interacts with the business environment/process.

BUC – What do you see? Notation?

 Business boundary, subject	A subject of a use case defines and represents boundaries of a business
 Association	Association is a relationship between classifiers
 Generalization	A generalization relationship is a relationship in which one model element (the child) is based on another model element (the parent). The child receives all of the attributes, operations, and relationships that are defined in the parent.

BUC – What do you see? Notation?



	<Include> 	<Extend> 
Use case A	Can not without B	Can exist without B. Does not know that B exists
Use case B	Does not know which use case is calling	Knows to which use case it belongs

BUC – What do you see? Notation?

- Multiplicity

Adornment	Semantics
0..1	Zero or 1
1	Exactly 1
0..*	Zero or more
*	Zero or more
1..*	1 or more
1..6	1 to 6
1..3,7..10,15, 19..*	1 to 3 *or* 7 to 10 *or* 15 exactly *or* 19 to many

BUC – Description

- See document
  - Template explained
  - Template blanc
  - Example (Airport)

Business use case – modeling steps (1)

Input business use case

- Context diagram
- Project kick off documents
- Other relevant documentation concerning the business area process

Business use case – modeling steps (2)

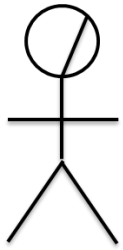
For Each Use Case:

1) Identify the Actors

- **Actor**: someone or something that interacts with, or uses, the system to achieve a desired goal.

  An actor may be:

  - A user of the system. Describe the user by their role
  - An individual who is not an user (customer, client, etc.)
  - The System under Discussion (SuD).
  - Describe it as “the system” Another system (external entity)



Business use case – modeling steps (3)

2) Identify the Goal: the aim, or purpose

- Goals summarize
  - System functionality in terms of use from a business
  - Perspective
  - Identify the goal
    - from the high-level scenario
    - by brainstorming
    - by asking “what does this Actor want to do?

Business use case – modeling steps (4)

3) Define the Pre-Conditions

- Pre-Condition
  - Something that must happen before the Use Case can start
  - Something that must be in place before the Use Case can start
  - Identify Pre-Conditions by asking:
    - “What must be in place for the Use Case to begin?”
    - “How do you know you need to do this?”

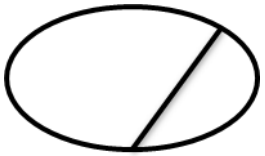
Business use case – modeling steps (5)

4) Define the Post-Conditions

- Post-Condition
  - The result, or successful outcome of the Use Case
  - Identify the Post-Conditions by asking:
    - “What is the successful result of this process or Use Case?

Business use case – modeling steps (6)

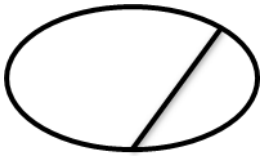
5) Describe the Main Flow



- Post-Condition
  - The result, or successful outcome of the Use Case
- Main Flow
  - Also known as primary scenario, a single thread of events
  - The simplest sequence – everything goes right
  - Ideally, no branching– make a note of relevant variations
  - Starts with pre-conditions and ends with post conditions
  - Describe the Main Flow by asking:
    - "What must happen to achieve the goal / outcome?"
    - "What does the actor need to do next?"
    - "What might happen next?"
    - "What do you need to do to get from the trigger to the outcome?"

Business use case – modeling steps (7)

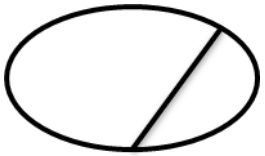
6) Describe the Exceptions



- Exceptions
  - Created to describe the failure situations
  - Things that may go wrong in the Use Case
  - Discover exceptions by asking:
    - “What could go wrong?”

Business use case – modeling steps (8)

7) Describe the Alternate Flows



- Alternate Flows:
  - Created to describe the variations on the main Flow
  - Results in successful outcome. Also referred to as scenarios ➔ (check extends and includes)
  - Listen for “sometimes”, “maybe”, and “it depends”
  - Discover alternate flows by asking:
    - “What might affect this Use Case?”

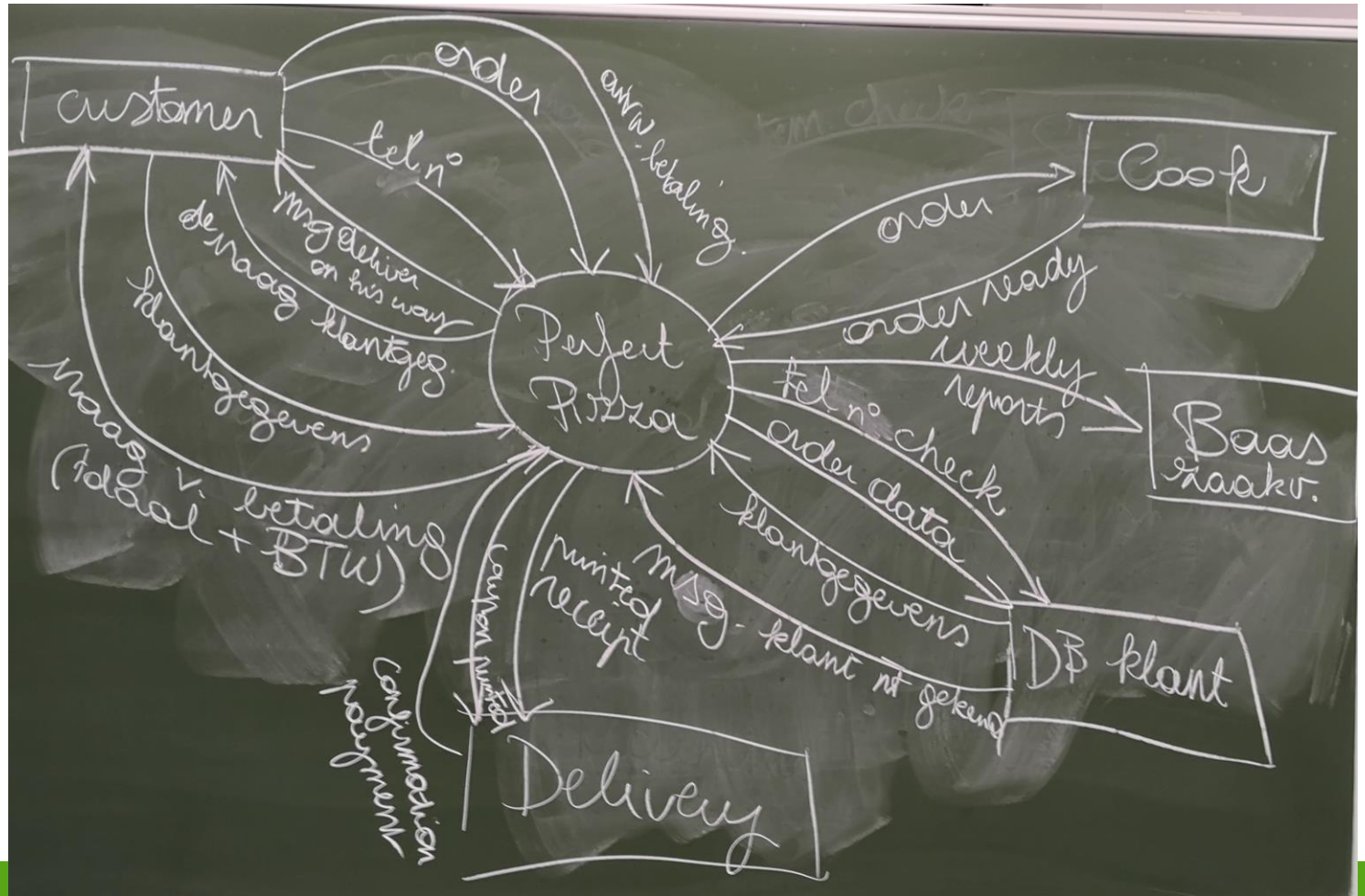
Note: in many CASE tools you can change an Actor or Use Case symbol to a Business Actor or Business Use Case symbol by an option in the properties panel of the symbol)

Business use case – modeling steps (10)

- !!! Note: in a Business Use Case diagram there is no system involved
- The System Use Case diagram will come into the picture later on, when (and if) the Business Use Case diagram is refined into a System Use Case diagram.

BUC exercise – Starting from context diagrams

- Create business use diagram for pizza perfect
- Fill out the business use case description with possible alternative and exceptional flows
- Use the underneath context diagram to start with



BUC exercise – Training process (1)

- An organization wants to improve its information system and, first of all, wishes to model the training process of its employees so that some of their tasks may be computerized.
  1. The training process is initialized when the training manager receives a training request on behalf of an employee. This request is acknowledged by the person in charge who qualifies it and then forwards his or her agreement or disagreement to the person who is interested.
  2. In the case of agreement, the person in charge looks in the catalogue of registered courses for a training course, which corresponds to the request. He or she informs the employee of the course content and suggests a list of subsequent sessions to him or her. When the employee has reached a decision, the training manager enrolls the entrant in the session with the relevant training body.

BUC exercise – Training process (2)

3. If something crops up, the employee must inform the training manager as soon as possible in order to cancel the enrolment or application.
4. At the end of the employee's training, he or she must submit an assessment to the training manager on the training course that he or she completed, as well as a document proving his or her attendance.
5. The training manager then checks the invoice that the training body has sent him or her before forwarding it to the bookkeeper of purchases.

Draw the Business Use Case Model

Make the Business Use Case Descriptions

BUC exercise – Bibliotheek (1)

- Een bibliotheek wil een applicatie maken voor het uitlenen van boeken.
- Leden kunnen maximaal vijf boeken tegelijk lenen.
- Om boeken te kunnen lenen moet je lid zijn van de bibliotheek.
- Een medewerker van de bibliotheek kan een nieuw lid inschrijven. Het is de bedoeling dat straks ieder lid een pasje met magneetstrip krijgt waarmee hij of zij zich kan identificeren. Een medewerker kan ook de gegevens van een lid wijzigen en een lid verwijderen. Om een lid op te zoeken in het systeem kan een medewerker het lidmaatschapnummer van het lid intoetsen, of het pasje van het lid scannen.
- Voor het lenen van een boek haalt het lid zijn pas door een magneetscanner en legt vervolgens de te lenen boeken onder een apparaat dat de streepjescode van de te lenen boeken leest. Als het lid klaar is met het invoeren van de boeken, moet deze zich nog even afmelden door een druk op een knop, zodat niet een volgend lid op zijn pas boeken kan scannen.

BUC exercise – Bibliotheek (2)

- Als een lid een boek terugbrengt legt deze het boek in de daarvoor bestemde retourbak.
- Een medewerker van de bibliotheek zorgt ervoor dat het boek weer als retour gemeld wordt in het systeem. Het boek hoeft hiervoor slechts gescand te worden.

Draw the Business Use Case Model

Make the Business Use Case Descriptions

BUC exercise – Car Rental System (1)

- As a software engineering Team leader you are tasked with developing a new car rental system.
- The new system will allow visitors to register as customers and rent the required car from personal computers attached to internet.
- Employees and customer service will be able to access the system ONLY from inside the car company (LAN) to administer the system and to fulfill the customer's requirements.
- The new system will allow visitors to browse the current database of cars, select a car and register to continue booking the car.

BUC exercise – Car Rental System (2)

- For each search or inquiry, the visitor has to provide the rental period, number of passenger, type of the car, pick-up and drop-off locations to be able to obtain the required results. The visitor has to register as customer during the checkout process, he can be asked to sign in to continue the checkout or to register as new customer.
- Employees are there to administer the system by adding new cars, new offers and maintaining the current database of cars, also to assist customers by replying their inquiries.

Draw the Business Use Case Model

Make the Business Use Case Descriptions

BUC exercise – PXL

- Draw the Business Use Case Model of all possible processes @PXL Campus
- Write the Business Use Case Description for the inscription of students

Questions & answers