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Faculty of Engineering, Built Environment and Information Technology

Fakulteit Ingenieurswese, Bou-omgewing en
Inligtingtegnologie / Lefapha la Boetšenere,
Tikologo ya Kago le Theknolotši ya Tshedimošo

Technical Design

- Screens
- Use cases
- Narratives

Introduction to technical requirements

Prof Marie Hattingh

Content

- What is technical design?
- Recap on screens
 - Remember your ERD
- Relationship between screens and use case diagrams
- The use case narrative

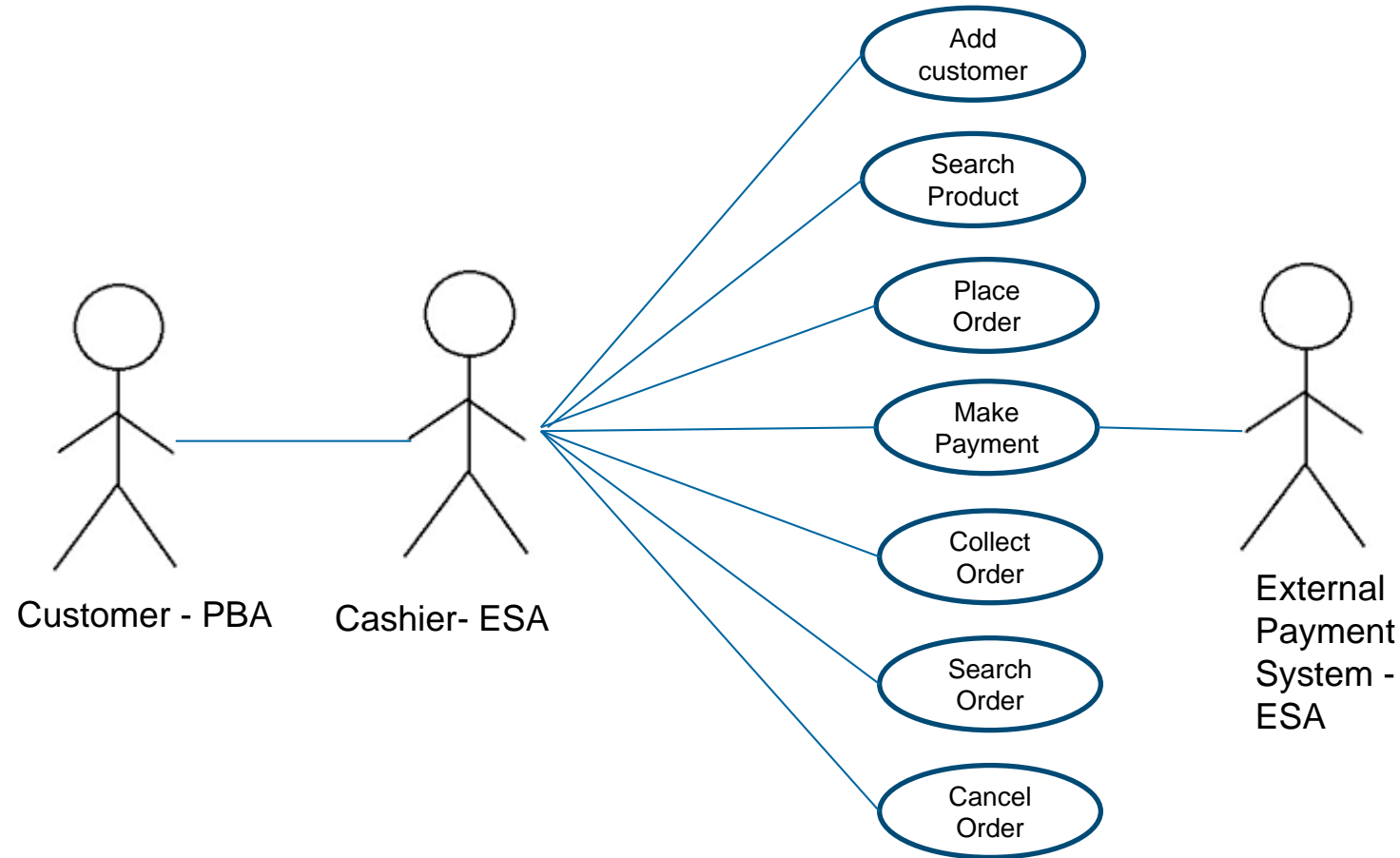
Technical design background

- Logical design (Semester 1)
 - WHAT the system must do.
 - No technical details are shown (no mention of technologies used).
 - Functional Specification document (Deliverable 2).
- Technical design (Semester 2)
 - HOW the system does the WHAT.
 - Shows technical details, such as technologies used.
 - Technical Specification document (Deliverable 4).
 - Can be completed either using process modelling or UML
- Both types of design are used in systems design – each type of document is written with a different end-user in mind
 - Functional specification: client or end-users.
 - Technical specification: developers.

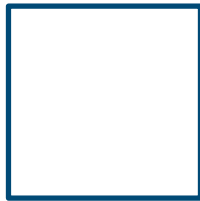
Recap on screens

- Use your logical narrative to derive screens
- Use your ERD to know which “fields” should be on screen
- Use/update your use case diagram to see how your screen should be initiated (and initiate different functions)

Take this use case diagram – customer ordering a product

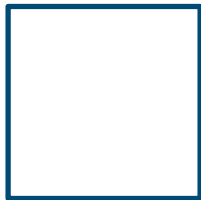


The case of ordering a product – option 1



Place Order Screen

The case of ordering a product – option 2



Place Order Screen

Take away



- Use the logical narrative as basis to design the screen
- Think how to make it easier for the user – how will the user want to use it
 - A good system needs to be seamless
 - You don't want to go out, come back and then get lost..
- Update the use case diagram to match the screens
- Ensure you design the screen based on your ERD – if needed, update your ERD

Technical Narratives



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Technical use case narrative

- Technology is added
 - Screen names
 - Controls on screens (e.g. buttons, text boxes, labels, drop-downs)
 - Input technology (e.g. document scanner)
 - Output technology (e.g. printer)
- Select “System Design” use case type on the narrative template:

USE CASE TYPE	
Business Requirements:	<input type="checkbox"/>
System Analysis:	<input type="checkbox"/>
System Design:	<input checked="" type="checkbox"/>

Technical use case narratives (cont.)

- **Logical Narrative**

TYPICAL COURSE OF EVENTS:	ACTOR ACTION:	SYSTEM RESPONSE:

- **Technical Narrative**

TYPICAL COURSE OF EVENTS:	ACTOR ACTION:	SYSTEM RESPONSE:	
		MANUAL ACTION:	AUTOMATED ACTION:
	All external actor actions <ul style="list-style-type: none">• PBA• ESA	PSA actions	System actions (automatic)



Take away



- You only need to describe a screen once. For example, describe the home screen during the login use case and then refer to it as a precondition.
 - The administrator needs to be logged in and the home screen is loaded.
- You always need to orientate the reader first – where will he initiate the screen for the use case from.
 - The administrator wants to add a new customer by navigating to the customer menu on the home screen and select the “add customer” menu item
- You need to describe the technology you use: Entity framework and LINQ query, using API etc
- When you insert, delete, retrieve, update a record in the database you need to indicate the technology: SQL insert query, SQL delete etc

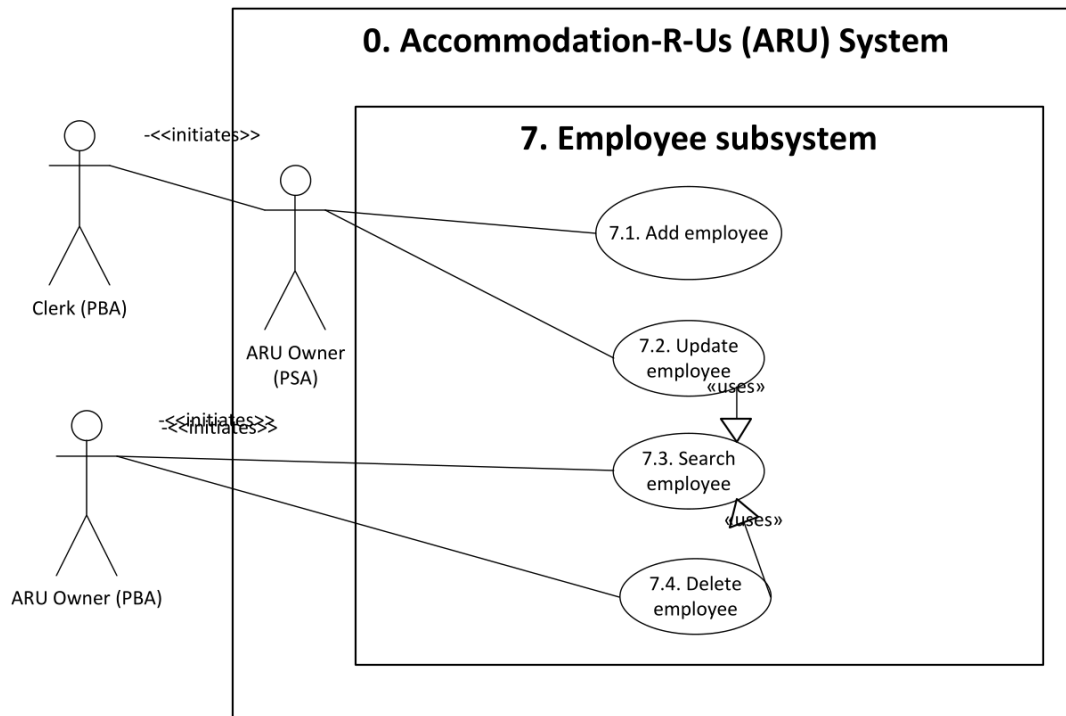
So what do you need?

- All the screens that are needed to execute the use case
- Logical use case narrative
- ERD



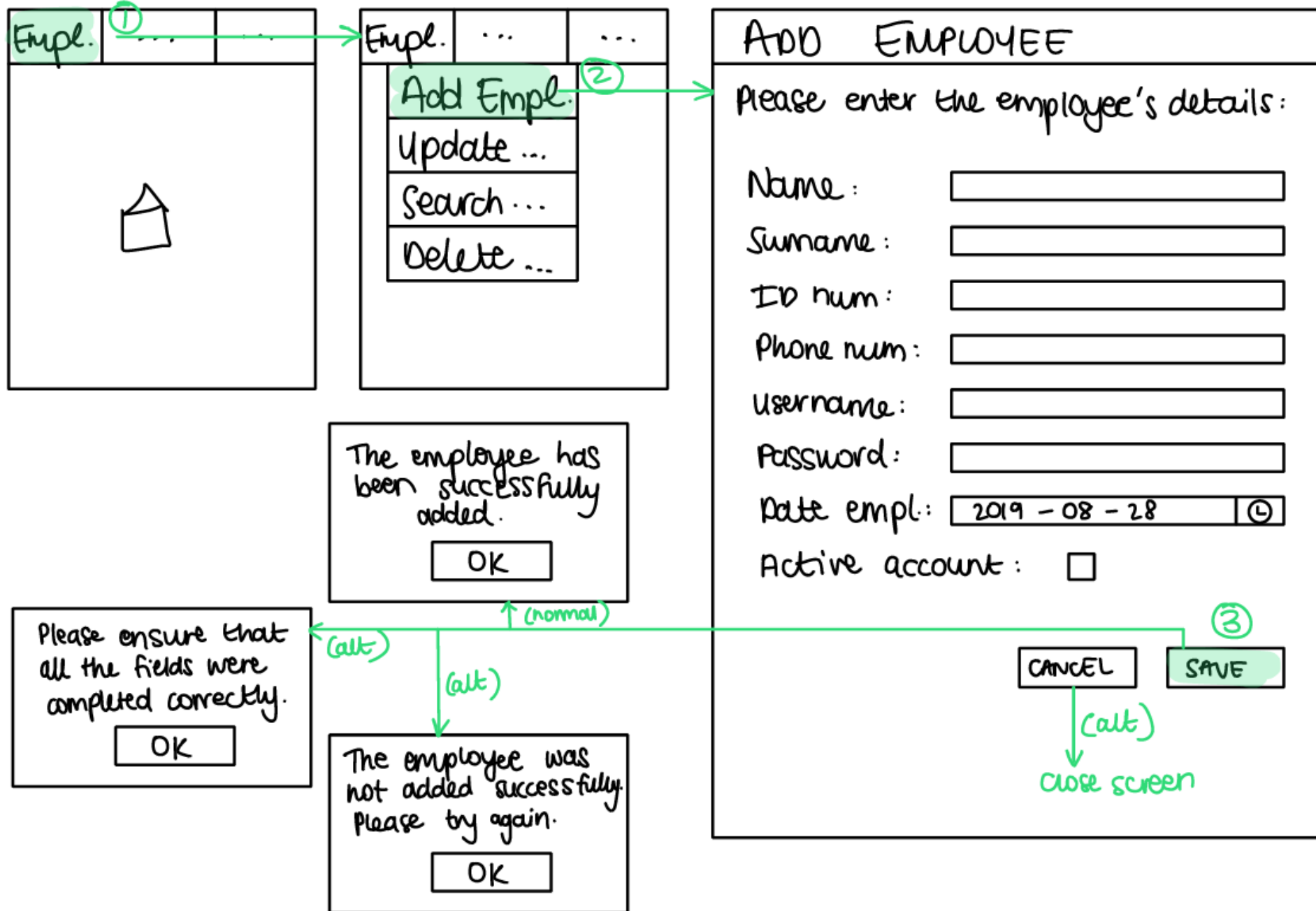
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Consider the following extract of the ARU system use case and narrative of use case 7.1 Add Employee



DESCRIPTION:		This use case describes the event where a new employee is added to the system. The use case starts when the clerk requests to be added to the system. The owner enters and saves all the clerk's details. The use case concludes with the system saving the clerk's details and notifying the owner that the details have been saved.
PRE-CONDITION:		<ul style="list-style-type: none"> The ARU Owner must be logged into the system.
TRIGGER:		The clerk wants to be added to the system.
TYPICAL COURSE OF EVENTS:	ACTOR ACTION:	SYSTEM RESPONSE:
	1. The clerk wants to be added to the system.	2. The ARU owner requests to add the new employee to the system.
		3. The system requests the employee to enter the following personal details of the clerk: <ul style="list-style-type: none"> Name Surname ID number Cell phone number Username Password Date of employment Whether their profile on the system should be active.
		4. The ARU owner asks the clerk for their personal details.
	5. The clerk provides their personal details.	6. The ARU owner enters the details into the system and saves.
		7. The system captures the entered details, saves it to the <u>Employee entity</u> and <u>User entity</u> and notifies the ARU owner that the employee has been successfully added. [alt]
		8. The ARU owner tells the clerk that they have been added to the system.
	ALTERNATE COURSES:	Alt step 7: Not all details have been entered correctly. The system notifies the owner that they need to complete all details. Return to step 6.

7.1 ADD EMPLOYEE



USE CASE NAME:	Add Employee	USE CASE TYPE	
USE CASE ID:	7.1.	Business Requirements:	<input type="checkbox"/>
PRIORITY:	High	System Analysis:	<input type="checkbox"/>
SOURCE:	ARU case study	System Design:	<input checked="" type="checkbox"/>
PRIMARY BUSINESS ACTOR:	Clerk (PBA)		
PRIMARY THE SYSTEM ACTOR:	ARU Owner (PSA)		
OTHER PARTICIPATING ACTORS:	None		
OTHER INTERESTED STAKEHOLDERS:	None		
DESCRIPTION:	This use case describes the event where a new employee is added to the system. The use case starts when the employee requests to be added to the system. The owner types and saves all the employee's details. The use case concludes with the system saving the employee's details and notifying the owner with pop-up message that the details have been saved.		
PRE-CONDITION:	<ul style="list-style-type: none">The ARU Owner must be logged into the system.		
TRIGGER:	The employee asks the owner to register him/her on the system.		
TYPICAL COURSE OF EVENTS:	ACTOR ACTION:	SYSTEM RESPONSE:	
		MANUAL ACTION:	AUTOMATED ACTION:
	1. The employee asks the owner to register him/her on the system.	2. The ARU owner navigates to the home screen, clicks on the Employee menu item in the Main Menu and then clicks on the Add Employee button.	3. The system responds by loading the Add Employee screen with the following controls (all controls are enabled unless specified otherwise): <ul style="list-style-type: none">Label:<ul style="list-style-type: none">"Please enter the new employee's details."Labels with corresponding text boxes (other controls specified below):<ul style="list-style-type: none">NameSurnameID number

			<ul style="list-style-type: none"> ○ Phone number ○ Username ○ Password ○ Date employed (with corresponding date picker, auto-filled with the current date) ○ Activate account (with corresponding check box, unchecked) • Buttons: <ul style="list-style-type: none"> ○ Cancel ○ Save
		4. The ARU owner asks the employee to provide their personal details.	
	5. The employee provides the following personal details: <ul style="list-style-type: none"> • Name • Surname • ID number • Cell phone number • Username • Password 	6. The ARU owner types the employee's details in the corresponding text boxes on the form. The owner also selects the date of employment in the date picker, checks the activate check box and clicks on the save button. [alt]	7. The system captures the typed information and validates that all the controls are completed and that the data was entered in the correct format. [alt] The system adds the new employee's information by using an SQL insert query to save the following attributes in the: <u>Employee entity:</u> <ul style="list-style-type: none"> • Name • Surname • PhoneNum • IDNum • EmploymentDate • Active <u>User entity:</u>

			<ul style="list-style-type: none"> • Username • Password
			<p>8. The system displays a pop-up message with the following controls [alt]:</p> <ul style="list-style-type: none"> • Label: "The employee has been successfully added." • Button: <ul style="list-style-type: none"> ○ OK
		9. The ARU owner clicks on the OK button and informs the employee that he/she has been successfully added to the system.	
ALTERNATE COURSES:	<p>Alt step 6: The employee tells the ARU owner he/she no longer wants to be registered on the system. The ARU owner clicks on the "cancel" button. The system terminates the use case.</p>		
	<p>Alt step 7: All the controls were not completed or the data was not entered in the correct format (validation error). The system displays a pop-up message with the following controls:</p> <ul style="list-style-type: none"> • Label: "Please ensure that all the fields were completed correctly." • OK button. <p>Return to step 6.</p>		
	<p>Alt step 8: The new employee was not added successfully. The system displays a pop-up message with the following controls:</p> <ul style="list-style-type: none"> • Label: "The employee was not added successfully. Please try again" • OK button. <p>The ARU owner informs the employee that he/she was not added to the system and that he/she will try again. Return to step 6.</p>		
CONCLUSION:	The ARU owner clicks on the OK button and informs the employee that he/she has been successfully added to the system.		
POST-CONDITION:	<ul style="list-style-type: none"> • A new employee's details are saved in the <u>Employee entity</u> 		

	<ul style="list-style-type: none"> A username and password is created for the employee in the <u>User entity</u>.
BUSINESS RULES:	<ol style="list-style-type: none"> New employees (clerks) can only be added to the system by the ARU owner. The employee must provide a document to the owner proving their eligibility for work – such as a South African ID document or work permit.
IMPLEMENTATION CONSTRAINTS AND SPECIFICATIONS:	None
ASSUMPTIONS:	None
OPEN ISSUES:	None



Different scenarios (straying into process modelling)

- Uses
- Calls
- Extend



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Uses

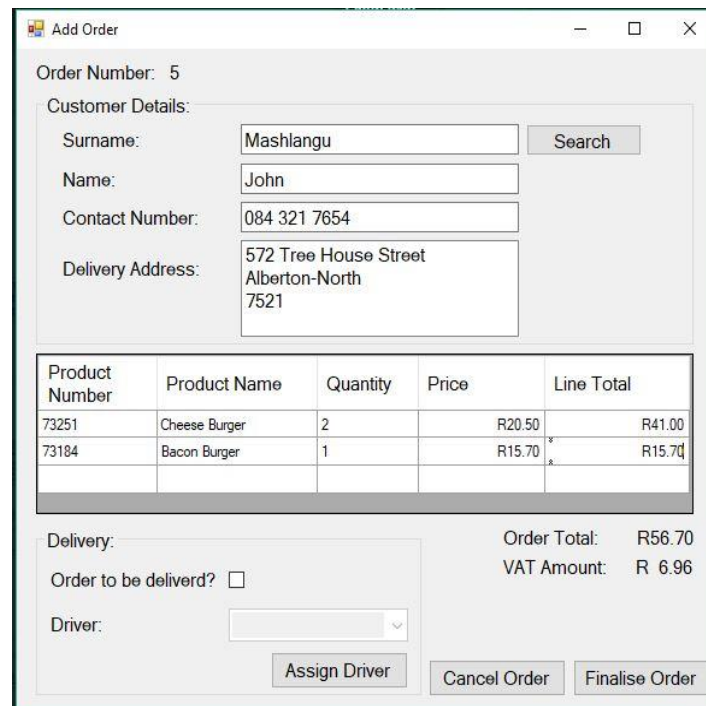
- Usually part of the screen, or a modal that feeds back into the screen (usually search)

USE CASE NAME:	Complete take-on inspection	USE CASE TYPE	
USE CASE ID:	4.3.	Business Requirements:	<input type="checkbox"/>
PRIORITY:	High	System Analysis:	<input type="checkbox"/>
SOURCE:	ARU case study	System Design:	<input checked="" type="checkbox"/>
PRIMARY BUSINESS ACTOR:	Clerk (PBA)		
PRIMARY THE SYSTEM ACTOR:	None		
OTHER PARTICIPATING ACTORS:	None		
OTHER INTERESTED STAKEHOLDERS:	None		
DESCRIPTION:	This use case describes the event where a clerk completes a take-on inspection of a new property. The system displays all the property information and the clerk inspects the property to determine if the information is correct. The clerk then makes a note on the condition of the property and indicates that the property has passed the inspection. The use case ends with the system saving the inspection details and notifying the clerk that the inspection was sucessfully completed.		
PRE-CONDITION:	<ul style="list-style-type: none">• The clerk must be logged into the system.• A take-on inspection for a specific property must already be scheduled.		
TRIGGER:	The clerk navigates to the home screen, clicks on the Inspection menu item in the Main Menu and then clicks on the Complete take-on inspection button.		
TYPICAL COURSE OF EVENTS:	ACTOR ACTION:	SYSTEM RESPONSE:	
		MANUAL ACTION:	AUTOMATED ACTION:
	1. The clerk navigates to the home screen, clicks on the Inspection menu item in the Main Menu and then clicks on the Complete take-on inspection button.		2. The system invokes use case 4.5. “Search inspection” to find the information of the property that is being inspected.
			3. The system responds by loading the Complete take-on inspection screen with the following controls (all controls are enabled unless specified otherwise): <ul style="list-style-type: none">• Label:



Calls

- Used to “call” another use case to hand over to that use case (don’t expect a return)
- Makes the system more user friendly
- Uses the exact same use case narrative template but include an ALT step to hand back control



The screenshot shows a software window titled "Add Order". It contains the following elements:

- Order Number:** 5
- Customer Details:**
 - Surname: Mashlangu (with a Search button)
 - Name: John
 - Contact Number: 084 321 7654
 - Delivery Address: 572 Tree House Street, Alberton-North, 7521
- Product Table:**

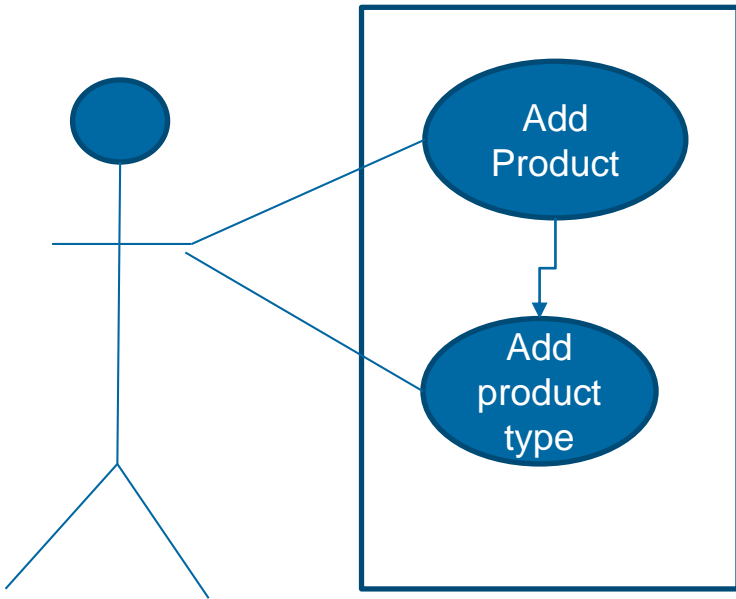
Product Number	Product Name	Quantity	Price	Line Total
73251	Cheese Burger	2	R20.50	R41.00
73184	Bacon Burger	1	R15.70	R15.70

- Delivery:**
 - Order to be delivered? ☐
 - Driver: (dropdown menu)
 - Buttons: Assign Driver, Cancel Order, Finalise Order
- Summary:**
 - Order Total: R56.70
 - VAT Amount: R 6.96



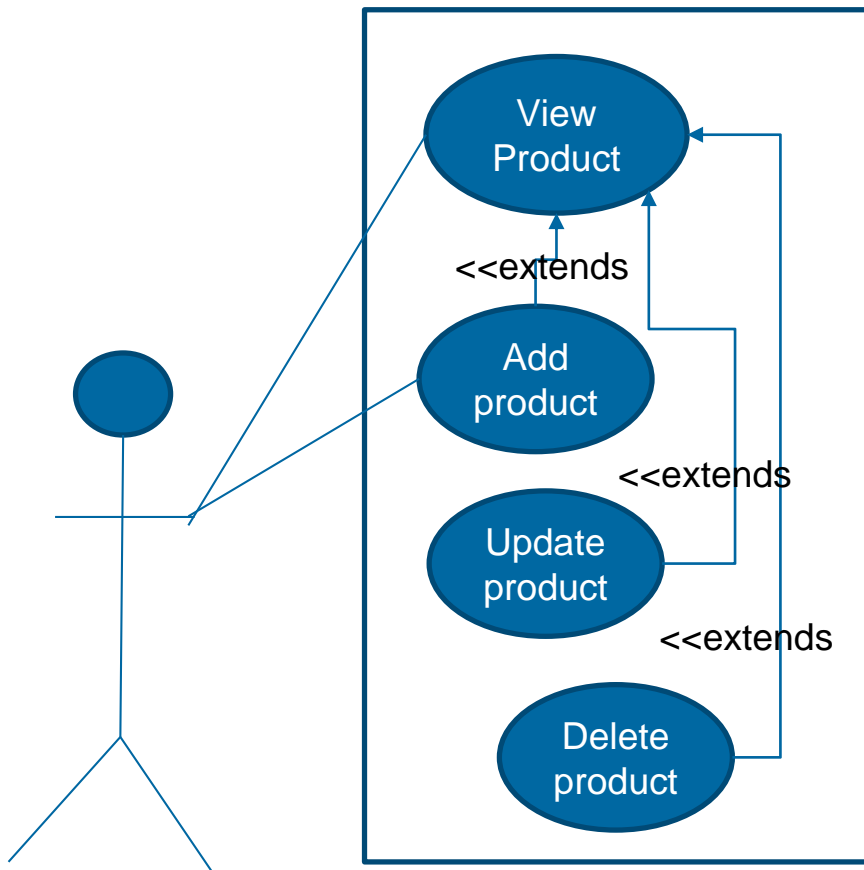
Calls

- The called use case start with the same first step as the use case
- The called use case has a alternative step guiding the user to the use case that called it as the last step



Extends

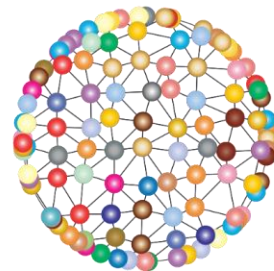
- Use case is initiated by another use case (no actor)
- First step is always to display the extended use case screen



USE CASE NAME:	View Product		USE CASE TYPE
USE CASE ID:			Business Requirements: <input type="checkbox"/>
PRIORITY:			System Analysis: <input type="checkbox"/>
SOURCE:			System Design: <input checked="" type="checkbox"/>
TYPICAL COURSE OF EVENTS:	ACTOR ACTION:	SYSTEM RESPONSE:	
		MANUAL ACTION:	AUTOMATED ACTION:
		1. The clerk wants to view the products in the system 2. The clerk clicks on the add product button [alt]	3. The System loads the view product screen: {describe screen} {display products loaded form the PRODUCT table} • Add product button • Update product button • Delete product button 4. The system loads the add product screen. The system invokes add product use case.
ALTERNATE COURSES:	Alt step 3a: The clerk clicks on the update product button. The system loads the update product screen. Invoke use case update product. Alt step 3b: The clerk clicks on the delete product button. The system loads the delete product screen. Invoke use case Delete product.		
CONCLUSION:			

USE CASE NAME:			USE CASE TYPE Abstract: <input type="checkbox"/> Extension: <input type="checkbox"/>
USE CASE ID:			
PRIORITY:			
SOURCE:			
PARTICIPATING ACTORS:	•		
DESCRIPTION:			
PRE-CONDITION:			
TYPICAL COURSE OF EVENTS:		Step 1: Display screen	
ALTERNATE COURSES:			
POST-CONDITION:			





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Complete Tutorial on Write off Stock Take

- Either complete Tuesday from 11:30 until 12:20
- Or
- Wednesday 8:30 until 9:20
 - Work in Pairs – both names to be written on tutorial submission

