

LESSON TITLE

Country	Cambodia
Language	■ English ■ Local Language
Course Title	Software Engineering
Lesson Title	02. Use Case
SME	Mr. TAL Tongsreng
Submission Date	September 18th, 2015
Version	1.0

Please provide the outline of course which will

- ☐ A : Text-based + Audio
- ☐ B : Text-based + Video
- ☐ C : Only Video

Use Case

1. Use Case components
2. Use Case relationships
3. Use Case drawing tools
4. StarUML
5. Visual Paradigm

1. Introduction > 1.1 Introduction / Overview

Please provide the introduction / overview on this lesson

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- ☐ C : Only Video

Overview

In this chapter, you are going to learn about

- Definition of Use Case
- Know different types of User Case relationships
- Know UML drawing tool
- Know basic usage of StarUML UML drawing tool
- Know basic usage of Visual Paradigm UML drawing tool

1. Introduction > 1.2 Learning Content

**Please make sure the hierarch of the content is well formed.
Please organize the lesson in 3-5 main topics and use 3-level headings.**

Level 1	Level 2	Level 3
1. Use Case Components	1.1 What is Use Case?	
	1.2. Weblog CMS Example	
	1.3. Components	
2. Use Case Relationships	2.1. Include	
	2.2. Special Case	
	2.3. Extend	
3. Use Case drawing tools	3.1. Why need drawing tool?	
	3.2. Different types of drawing tools	
	3.3. Introduce Some Drawing Tools	

1. Introduction > 1.2 Learning Content

**Please make sure the hierarch of the content is well formed.
Please organize the lesson in 3-5 main topics and use 3-level headings.**

Level 1	Level 2	Level 3
4. StarUML	4.1. Versions of StarUML	
	4.2. Use Case representation in StarUML	
	4.3. StarUML usage and example	
5. Visual Paradigm	5.1. Versions of Visual Paradigm	
	5.2. Use Case representation in Visual Paradigm	
	5.3. Visual Paradigm usage and example	

1. Introduction > 1.4 Learning Objectives

Please provide objective of the lesson by high light keyword and follow (Audience, Behavior, Condition, Degree) to write the objective

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- ☐ C : Only Video

Objective

Upon completion of this chapter, you will be able to

- Define elements in Use Case
- Identify different types of Use Case relationship
- Define some useful tools for drawing UML diagrams
- Use StarUML to draw Use Case diagram
- Use Visual Paradigm to draw Use Case diagram

1. Introduction > 1.5 Keywords ()

Please provide keywords of the lesson with explanation

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- ☐ C : Only Video

Keywords	Description
Use Case	is a case where your system is used to fulfill one or more of your user's requirements
Requirement	a thing that user needs or wants.
Visualization	visual aids, to make us able to see our system (not abstract anymore)
Construction	build and create our system
Documentation	easy to document (write report)

1. Introduction > 1.5 Pre-Test

- ☐ A : Fill in the blank
- ☐ B : Short answer question
- ☐ C : Multiple Choice

Feedback type

- ☐ A : Text-based short answer
- ☐ B : Text-based short answer and more information
- ☐ C : Video based feedback

Pre-Test

Question	Possible answers	Correct Answer	Feedback of the question
What is specification?	<ol style="list-style-type: none">1. Feedback on what user think about the software2. To make something clear, to make our system understandable3. Something to specify what is going to do everyday	2. To make something clear, to make our system understandable	Feedback is comment that will be converted to Specification only if this feedback is exactly what user need.

1. Introduction > 1.5 Pre-Test

- ☐ A : Fill in the blank
- ☐ B : Short answer question
- ☐ C : Multiple Choice

Feedback type

- ☐ A : Text-based short answer
- ☐ B : Text-based short answer and more information
- ☐ C : Video based feedback

Pre-Test

Question	Possible answers	Correct Answer	Feedback of the question
Why do we draw diagram?	<ol style="list-style-type: none">1. To explain to stakeholder to prevent misunderstanding2. To explain to developer when there is misunderstanding3. For playing with software workflow	<ol style="list-style-type: none">1. To explain to stakeholder to prevent misunderstanding	The 2 answer is not correct because, we already spent time to implement the wrong thing until we meet the problem. So we lost time and money.

1. Introduction > 1.5 Pre-Test

- ☐ A : Fill in the blank
- ☐ B : Short answer question
- ☐ C : Multiple Choice

- Feedback type
- ☐ A : Text-based short answer
 - ☐ B : Text-based short answer and more information
 - ☐ C : Video based feedback

Pre-Test

Question	Possible answers	Correct Answer	Feedback of the question
Which one is a real requirement?	<div>1. The software should be able to list all production with price and promotion</div> <div>2. I can manage time to translate the requirement of the software</div> <div>3. I need someone to help me build this software</div>	<div>1. The software should be able to list all production with price and promotion</div>	

2. Learn> Topic: 1. 1. What is Use Case?

- ☒ A : Text-based + Audio
- ☐ B : Text-based + Video
- ☐ C : Only Video

- A use case is a case (or situation) where your system is used to fulfill one or more of your user's requirements
- A use case captures a piece of functionality that the system provides
- Use cases are at the heart of your model since they affect and guide all of the other elements within your system's design

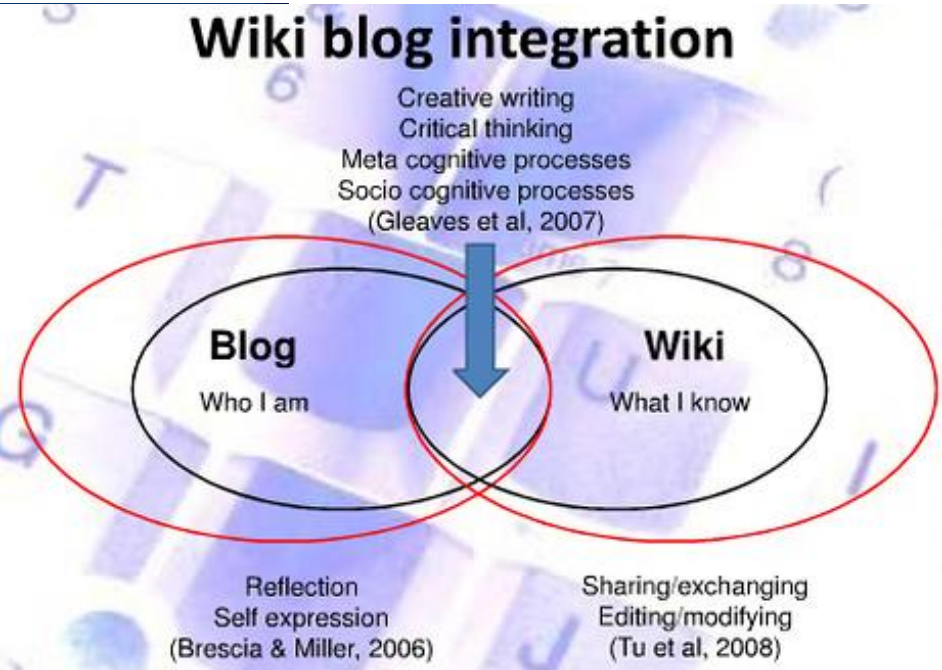
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Contents



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- ☐ C : Only Video

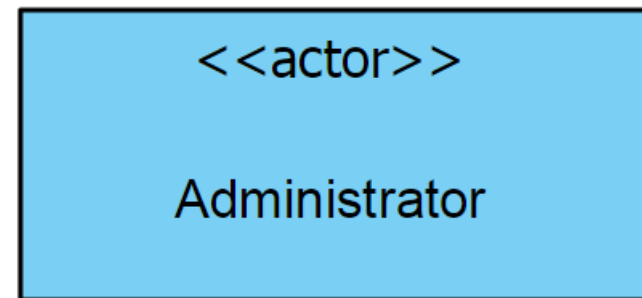
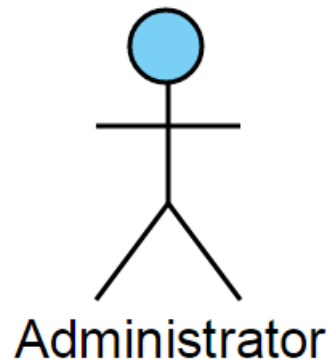
- Requirement A.1: The content management system (CMS) shall allow an **admini**strator to **create a new blog account**, provided the **personal details** of the new **blog ger** are **verified** using the **author credentials database**.
- Requirement A.2: The CMS shall allow an **administrator** to **create a new personal Wiki**, provided the **personal details** of the applying **author** are **verified** using the **Author Credentials Database**.



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- ☐ C : Only Video

- Actors: **things** that **interact** with your **system**
 - Notation: a stick man or a labeled box



- **Actors** should be **given appropriate names**

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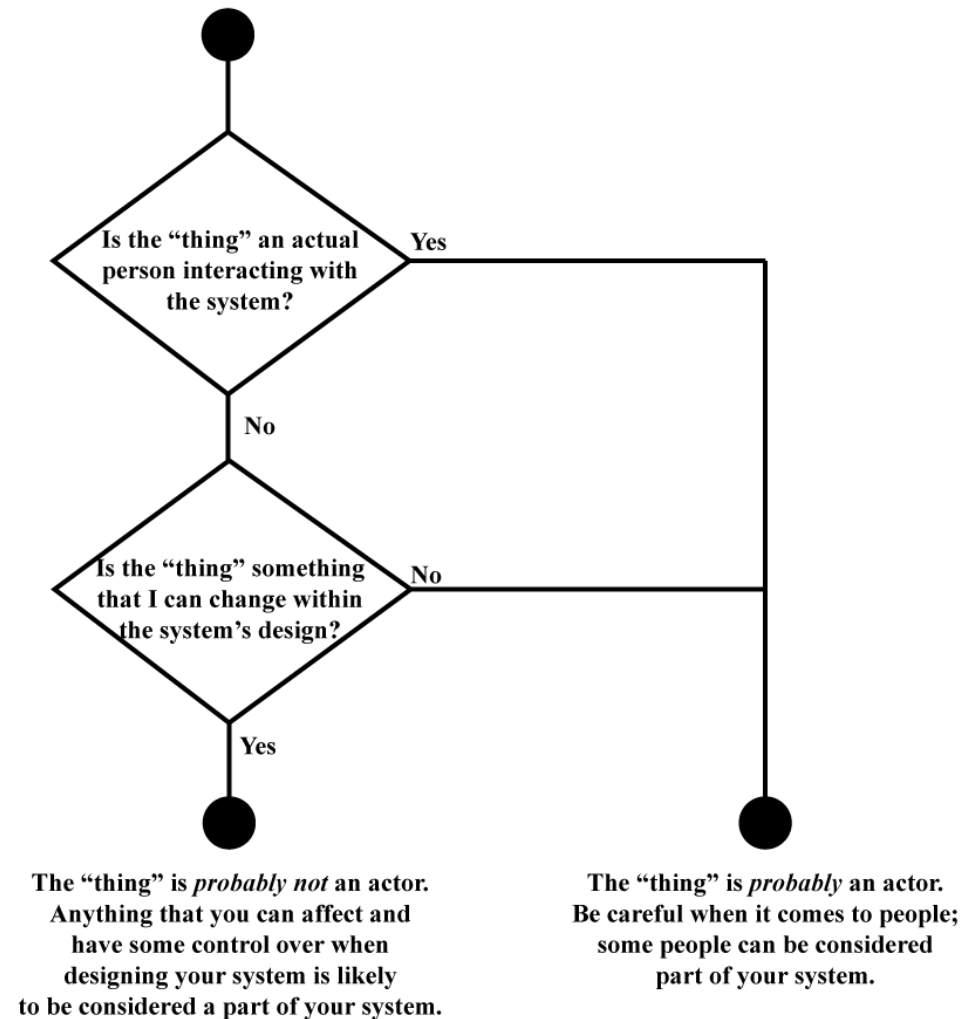
- ☒ A : Text-based + Audio
- ☐ B : Text-based + Video
- ☐ C : Only Video

■ Identifying an actor

- **Actors don't have to be actual people**
- An actor can also be a **third party's system**
- **Tricky actors**

Ex: System clock

Identify a "thing" from your requirements

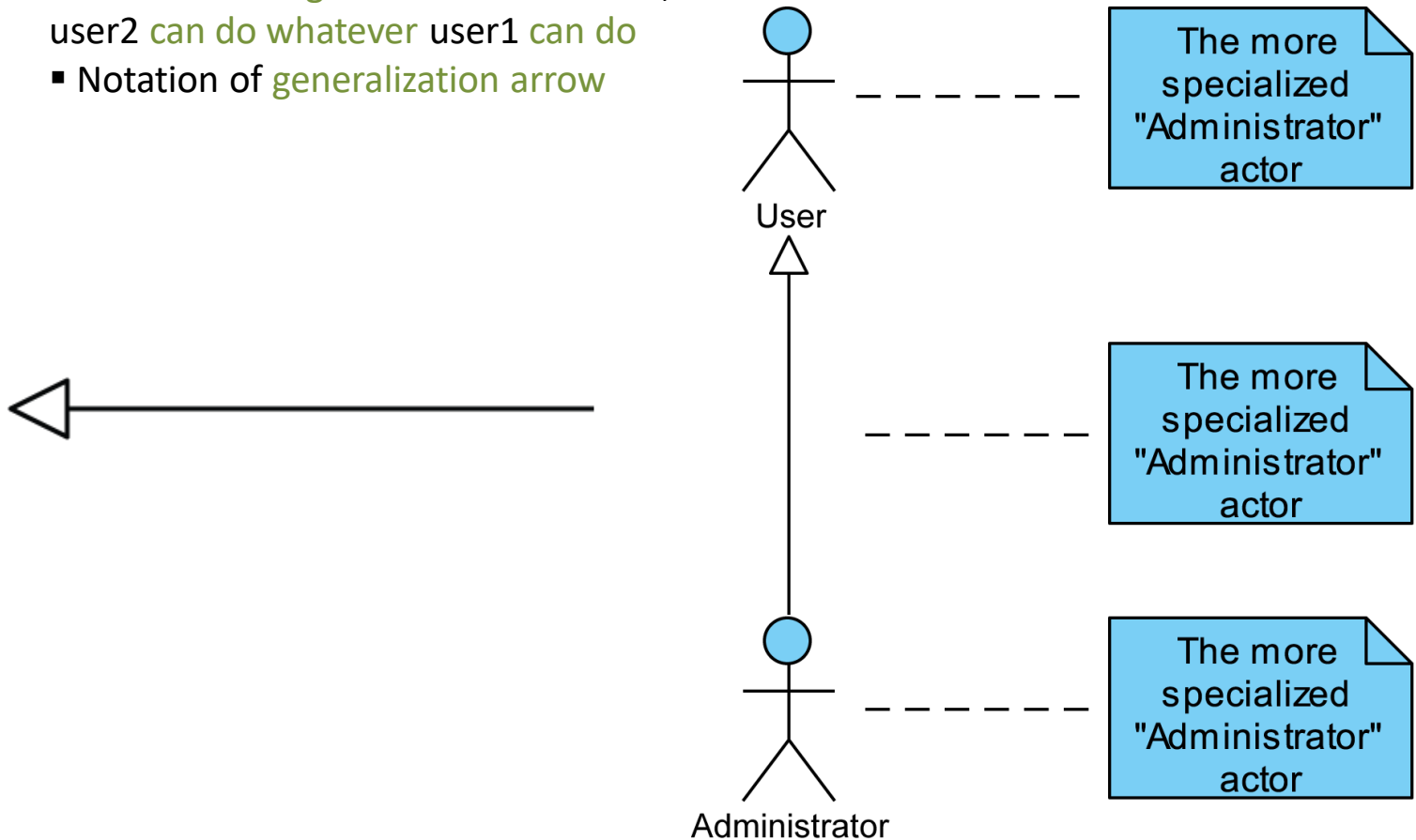


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- ☐ C : Only Video

▪ Refining actors

- Some **actors** are **related to each other** (**generalization**)
- If user1 is the **general actor** of user2, it means that user2 **can do whatever** user1 **can do**
- Notation of **generalization arrow**



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- **Use cases:** **interactions** or **cases** where the **system** is being used to complete a specific job
 - Notation: an **oval** with a **name** that **describes** the **interaction** that it represents



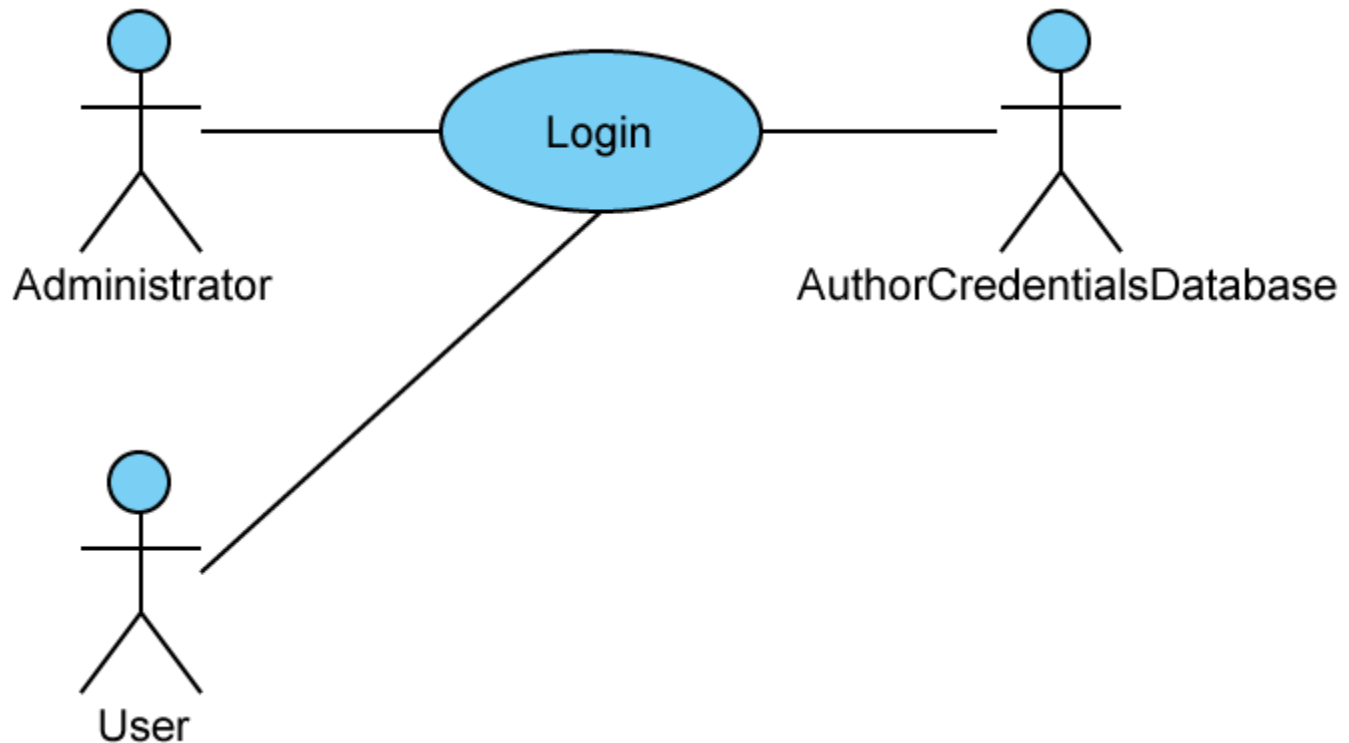
- What makes a good use case?

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■ Communication Lines

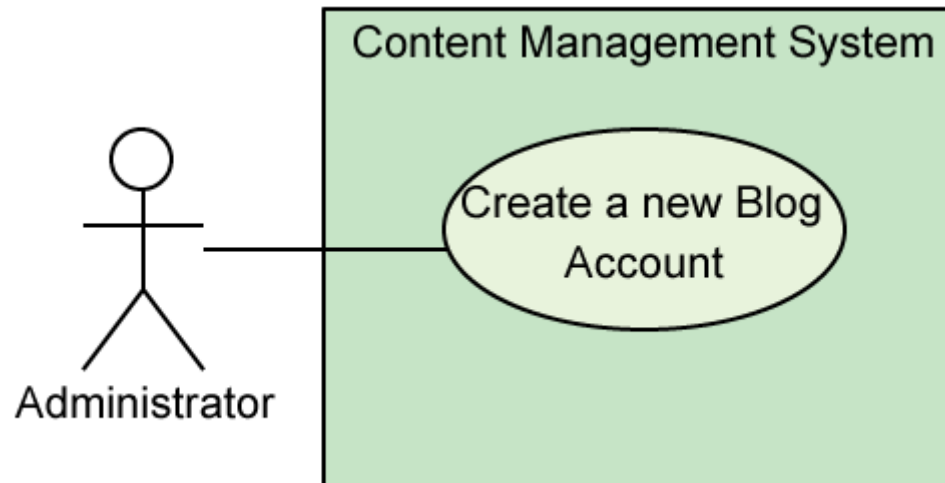
- A communication line **connects** an **actor** and a **use case** to show the actor **participating** in the **use case**



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- System Boundaries: are used as a **separation between actors** (external) and **use cases** (internal)
 - Notation: a **box**
 - It is a good practice to **name your boundary box**



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	<ul style="list-style-type: none">▪ Use Case Descriptions<ul style="list-style-type: none">▪ Related requirements▪ Goal in context▪ Preconditions▪ Successful end condition▪ Failed end condition▪ Primary actors▪ Secondary actors▪ Trigger▪ Main flow▪ Extension

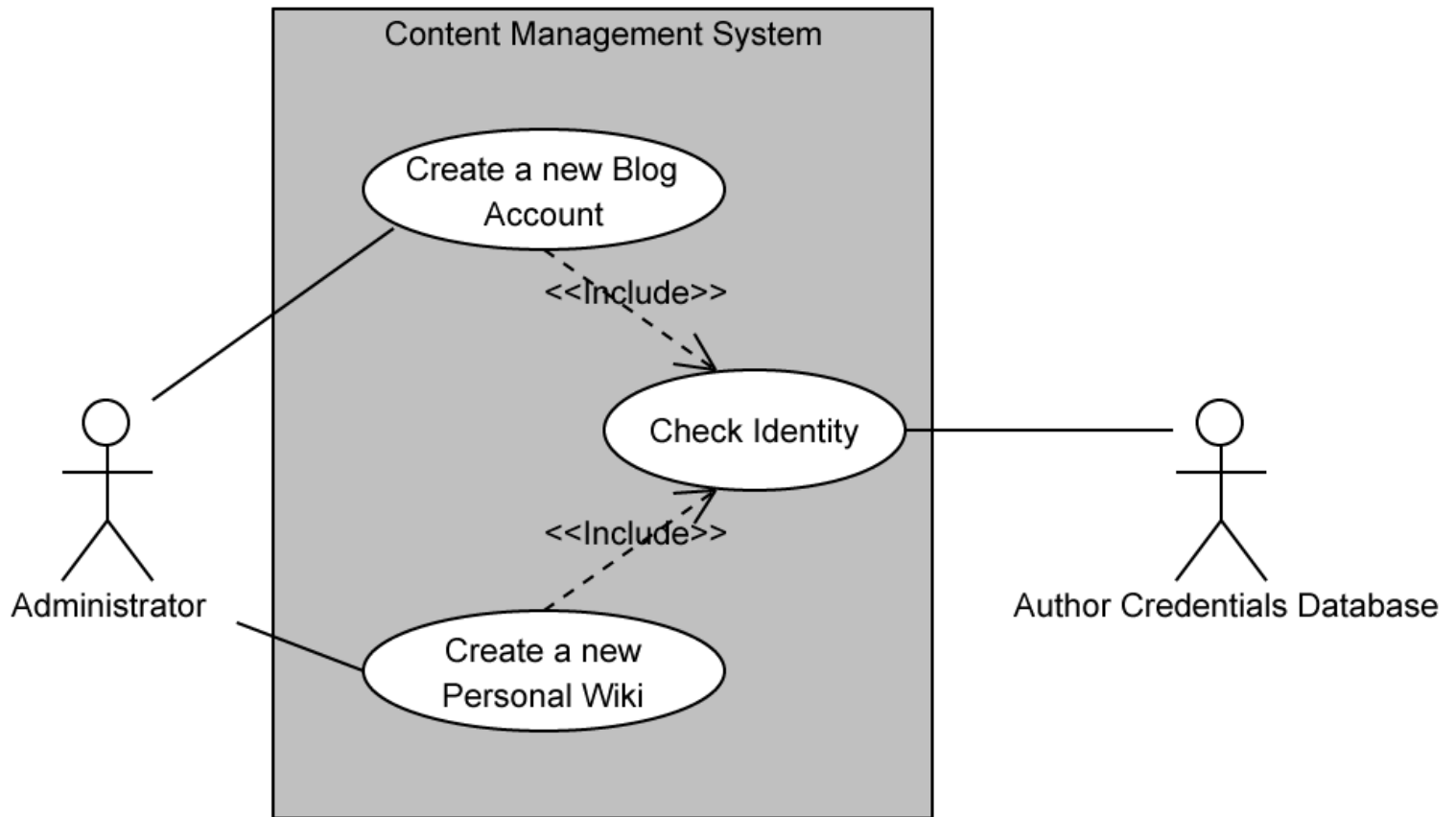
2. Learn> Topic: 2.1. Include

- ☒ A : Text-based + Audio
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▪ The <<include>> Relationship: is used to represent a use case that can be reused by other use cases

▪ Notation: a dotted arrow labeled with <<include>>

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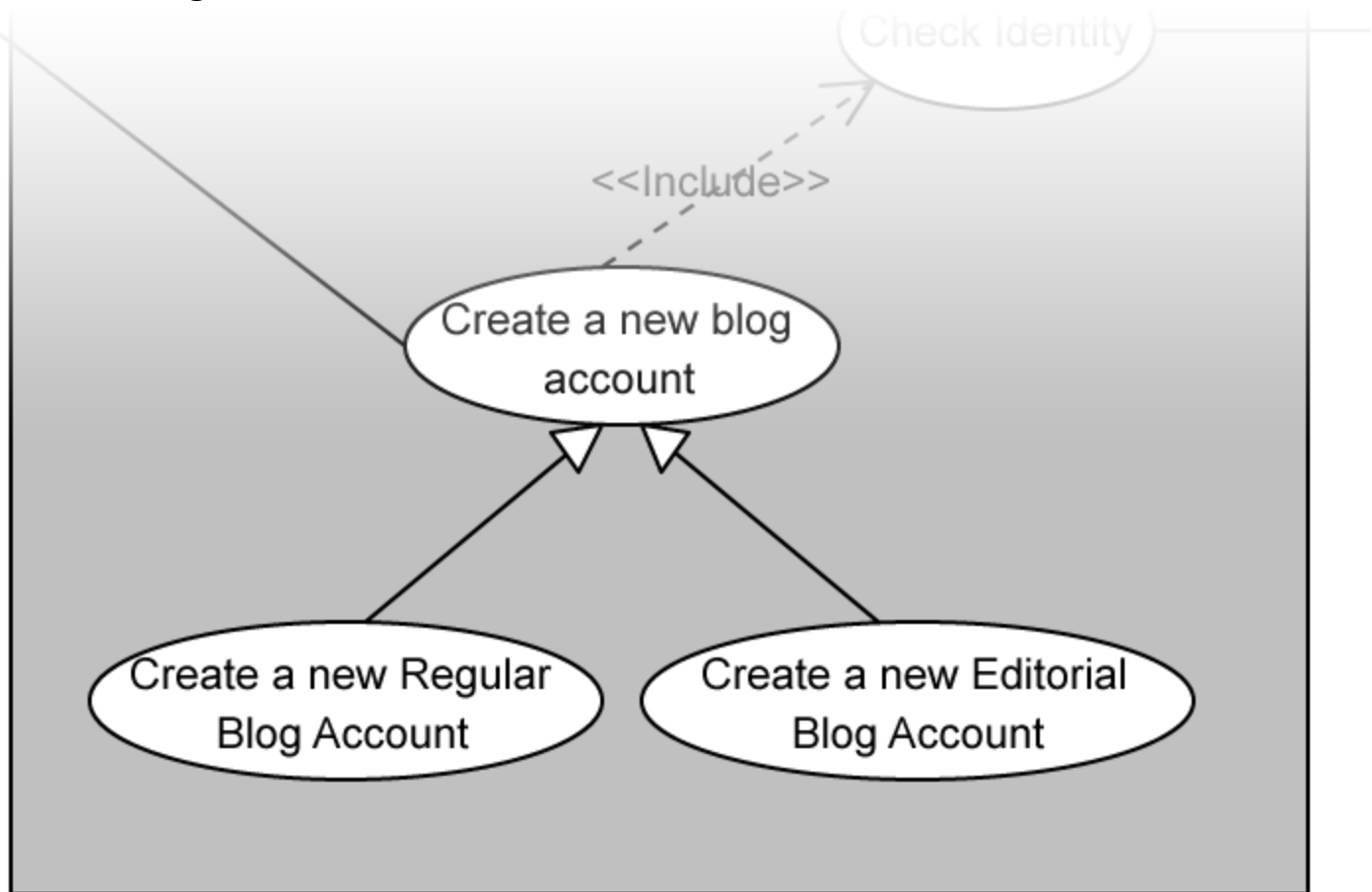
2. Learn> Topic: 2.2. Special cases

- ☒ A : Text-based + Audio
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- ☐ C : Only Video

▪ Special cases: **one use case** is a **special type of another** use case (use case **generalization** or **use case inheritance**)

▪ Notation: generalization **arrow**

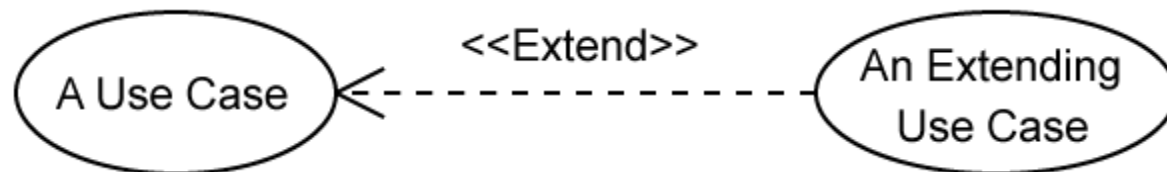
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- The <<extend>> Relationship: is used to represent a **reusable behavior** that is **optional**.
 - Notation: a dotted arrow labeled with <<extend>>



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- UML Drawing Tools are drawing spaces that contain predefined canvases.
- Use Case Diagram is one of other diagrams in UML, so UML drawing tools can be use to draw Use Case Diagram.
- We can categorize those UML drawing tools into 2 types:

- Online UML drawing tool

- Cacao
- Draw.io
- Gliffy
- etc.



gliffy



- Offline UML drawing tool

- Smart Draw
- Star UML
- Visual Paradigm
- etc.



2. Learn> Topic: 3.1. Why need drawing tool?

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- ☐ C : Only Video

- **Rapid, Shorter time** than hand drawing
- **Easy sharing** to related person (stakeholders)
- More **professional** (good look, **standard**, and **compact**)
- **Safe** (backup, versioning, set password lock)
- **Reusable**



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- Online UML drawing tools
 - Easy to use,
 - Do not need to install,
 - Not require disk space on local machine
 - Up to date tools and components
 - Rich features
 - Store on remote server, it is safe
 - Easy sharing, just provide the link, online editing together
- Offline UML drawing tools
 - Fast drawing,
 - No need internet,
 - No need to wait for downloading things

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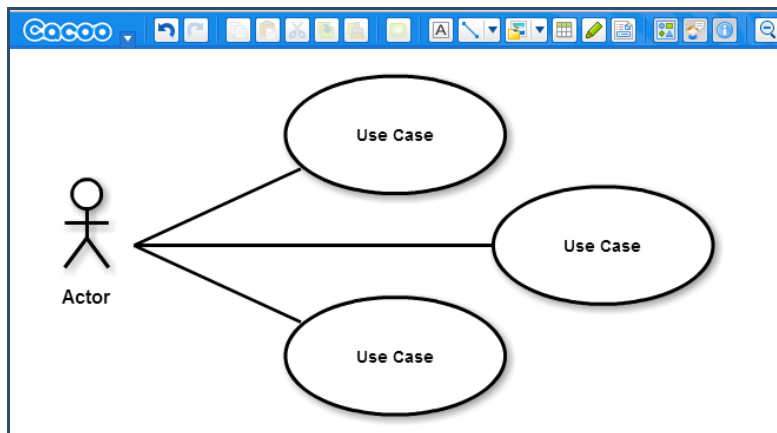
- ☒ A : Text-based + Audio
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- ☐ C : Only Video

▪ Draw.io

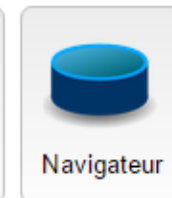
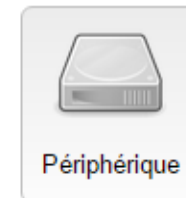
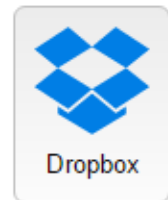
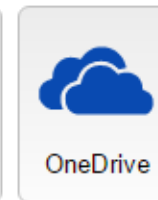
- An online tool
- Use remote storage server such as Google Drive, OneDrive, Dropbox, ...

▪ Cacoo.com

- An online tool
- Store on Cacoo server or other remote server
- StarUML
- VisualParadigm



Enregistrer sous:

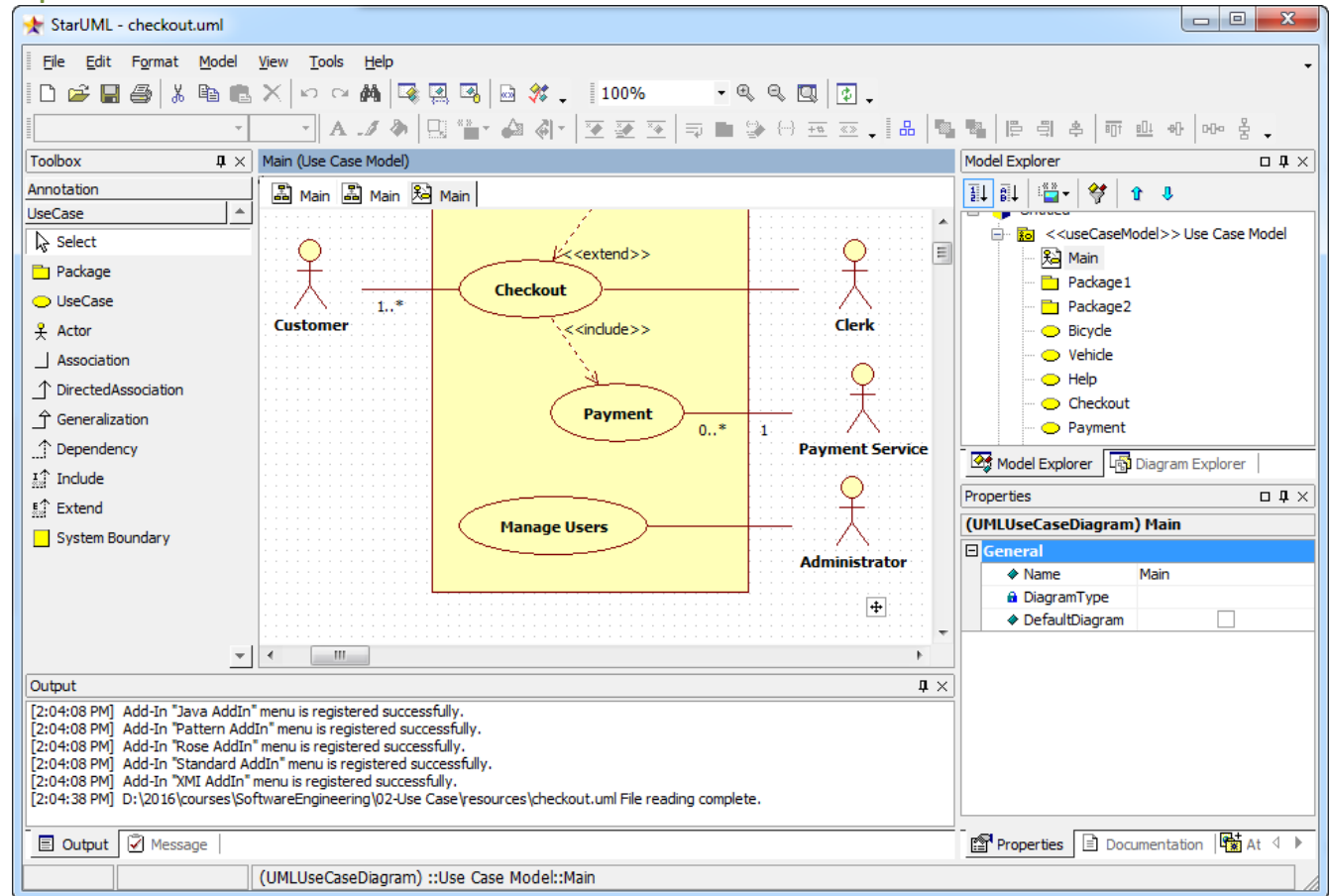


2. Learn> Topic: 4. StarUML

- ☒ A : Text-based + Audio
- ☐ B : Text-based + Video
- ☐ C : Only Video

- An **Offline UML drawing tool**
- Version 2 No time limit for **evaluation**, a license should be **purchased for continued use**
- Version 1 is **Open Source**
- Easy to use

(1) Learning Contents



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- ☒ A : Text-based + Audio
- ☐ B : Text-based + Video
- ☐ C : Only Video











- Version 1, free and **Open Source**, Features:
 - **Use Case** Diagram
 - **Class** Diagram
 - **Sequence** Diagram
 - **Collaboration** Diagram
 - **Statechart** Diagram
 - **Activity** Diagram
 - **Component** Diagram
 - **Deployment** Diagram
 - Code Generation
 - etc.
- Version 2, free and paid
 - The **same features as version 1**, but include
 - **Hyperlinks**
 - Support Accept Time Event Action
 - **JavaScript** Extension
 - **Shorthands** in **QuickEdit** for Fast Modeling
 - etc.

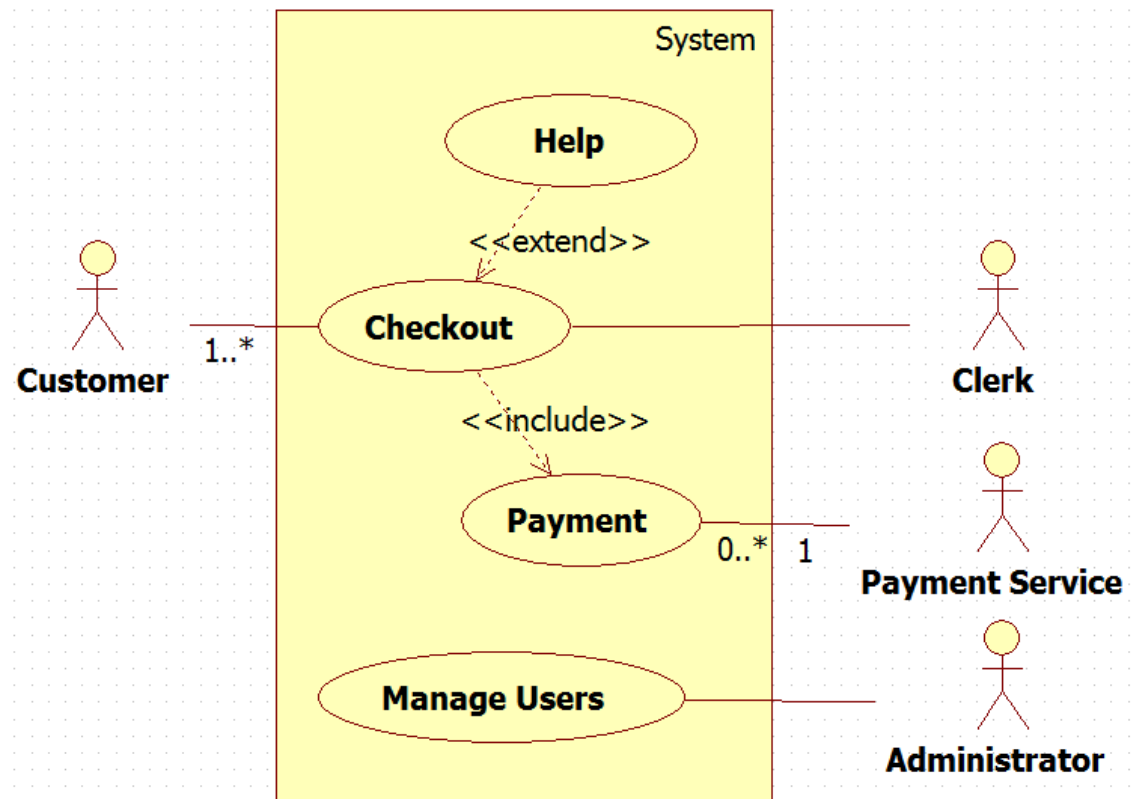
2. Learn> Topic: 4.2. Use Case representation in StarUML

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- ☒ A : Text-based + Audio
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- ☐ C : Only Video

- Package
- UseCase
- Actor
- Association
- DirectedAssociation
- Generalization
- Dependency
- Include
- Extend
- System Boundary

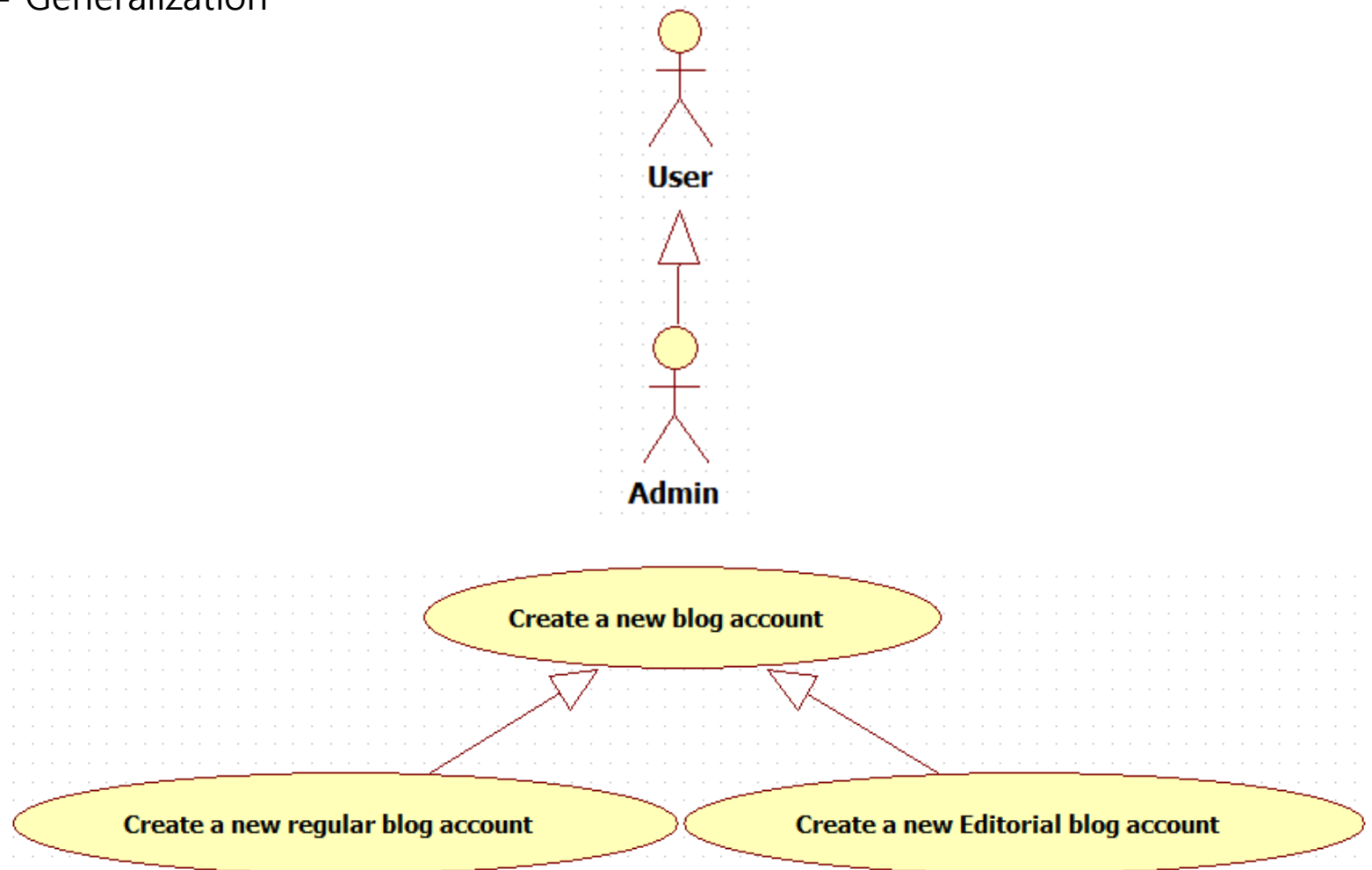
-  Package
-  UseCase
-  Actor
-  Association
-  DirectedAssociation
-  Generalization
-  Dependency
-  Include
-  Extend
-  System Boundary



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- ☒ A : Text-based + Audio
- ☐ B : Text-based + Video
- ☐ C : Only Video

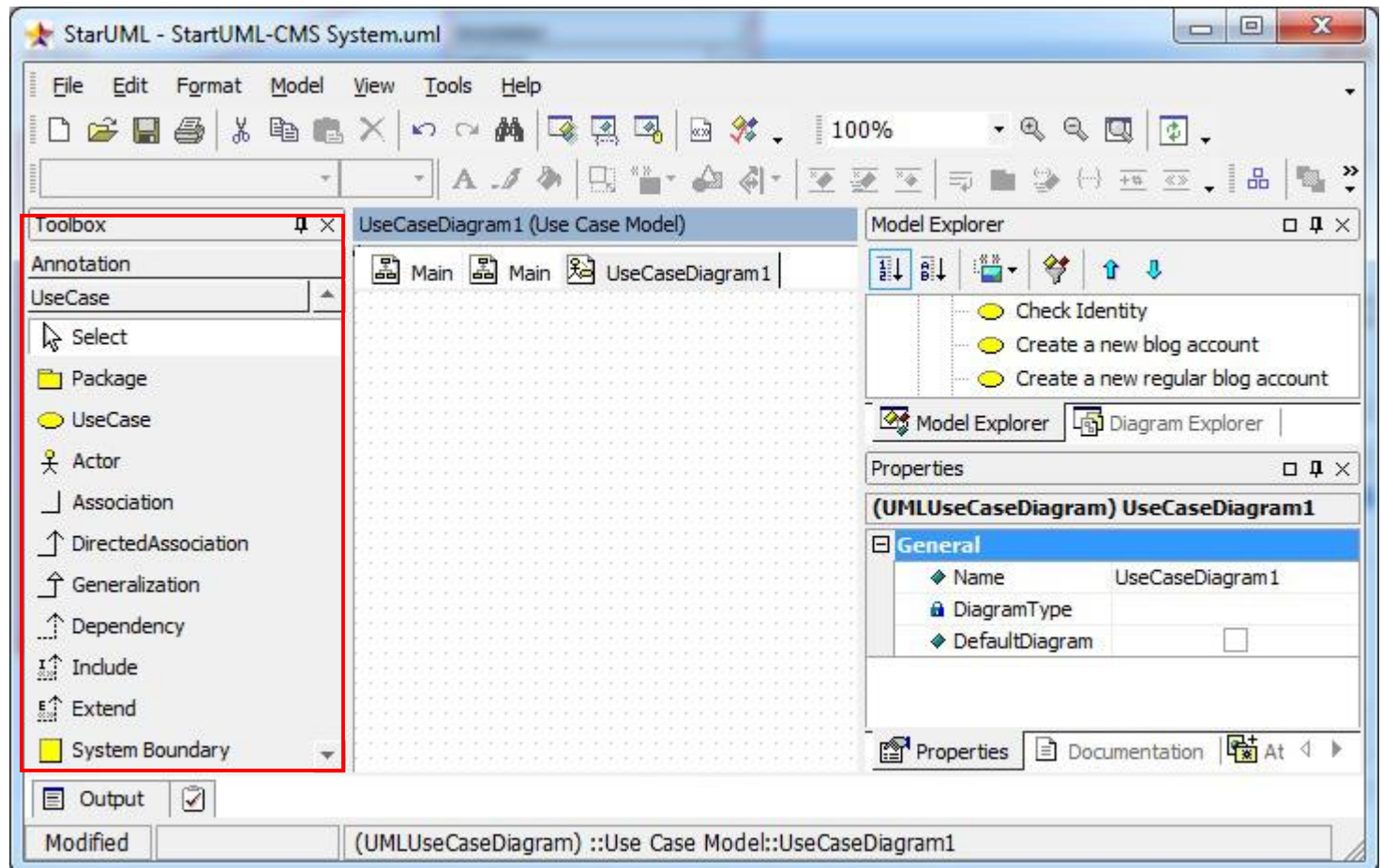
▪ Generalization



2. Learn> Topic: 4.3. StarUML usage and example

- ☒ A : Text-based + Audio
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- ☐ C : Only Video

■ Toolbox

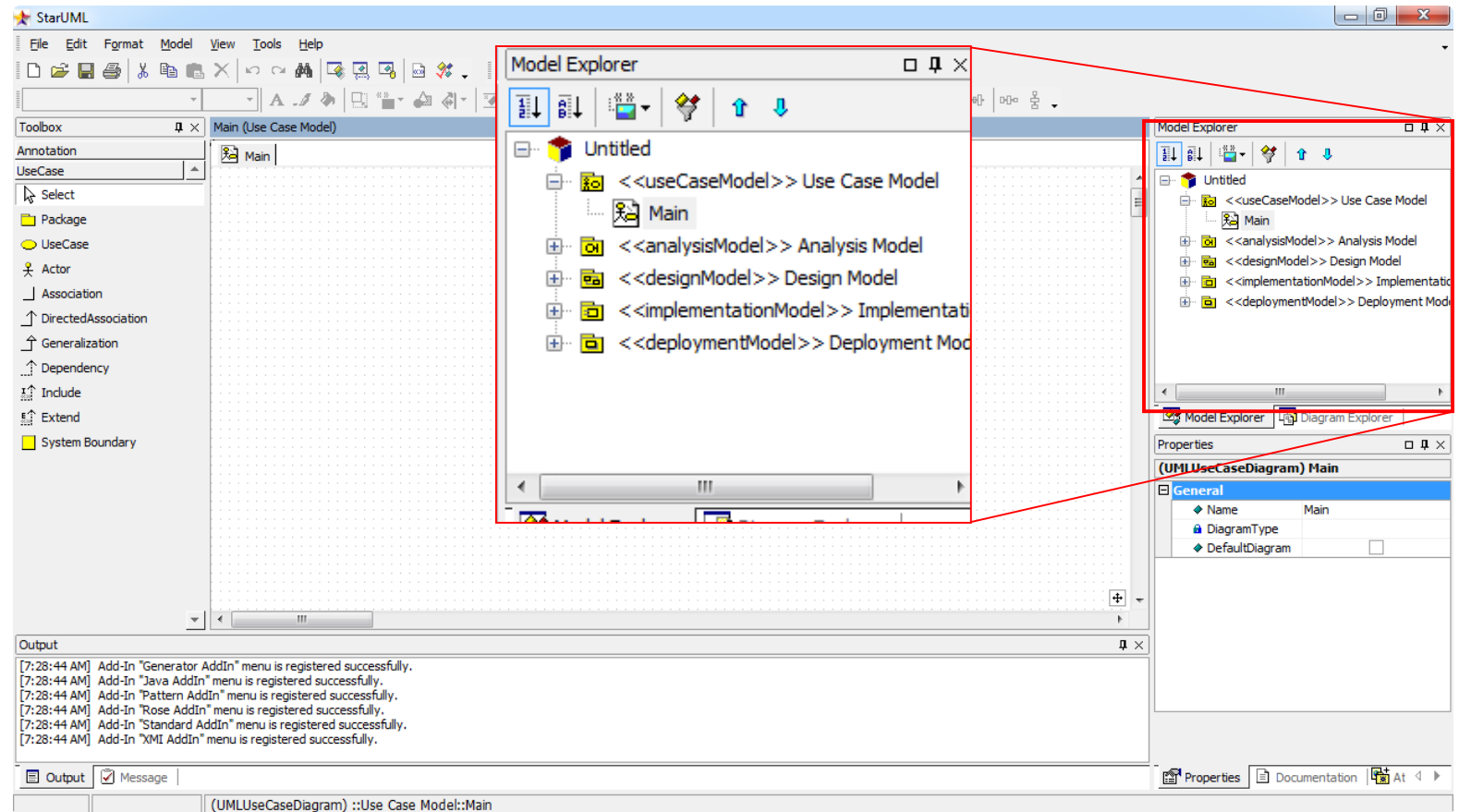


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2. Learn> Topic: 4.3. StarUML usage and example

- ☒ A : Text-based + Audio
- ☐ B : Text-based + Video
- ☐ C : Only Video

■ Model Explorer



2. Learn> Topic: 4.3. StarUML usage and example

- ☒ A : Text-based + Audio
- ☐ B : Text-based + Video
- ☐ C : Only Video

■ Properties

The screenshot displays the StarUML application window. The main canvas shows a Use Case Model with a single use case named 'Main'. The 'Properties' window is open, showing the 'General' tab for the selected use case. The 'Name' property is set to 'Main', and the 'DiagramType' is set to 'Use Case Model'. The 'DefaultDiagram' property is set to 'Main'. The 'Model Explorer' on the right shows the project structure, including the 'Main' use case. The 'Output' window at the bottom shows a list of messages, including 'Add-in "Generator AddIn" menu is registered successfully.' and 'Add-in "XML AddIn" menu is registered successfully.'

Properties (UMLUseCaseDiagram) Main

General	
Name	Main
DiagramType	
DefaultDiagram	

Model Explorer

- Untitled
 - <<useCaseModel>> Use Case Model
 - Main
 - <<analysisModel>> Analysis Model
 - <<designModel>> Design Model
 - <<implementationModel>> Implementation
 - <<deploymentModel>> Deployment Model

Output

```
[7:28:44 AM] Add-in "Generator AddIn" menu is registered successfully.  
[7:28:44 AM] Add-in "Java AddIn" menu is registered successfully.  
[7:28:44 AM] Add-in "Pattern AddIn" menu is registered successfully.  
[7:28:44 AM] Add-in "Rose AddIn" menu is registered successfully.  
[7:28:44 AM] Add-in "Standard AddIn" menu is registered successfully.  
[7:28:44 AM] Add-in "XML AddIn" menu is registered successfully.
```

Properties (UMLUseCaseDiagram) Main

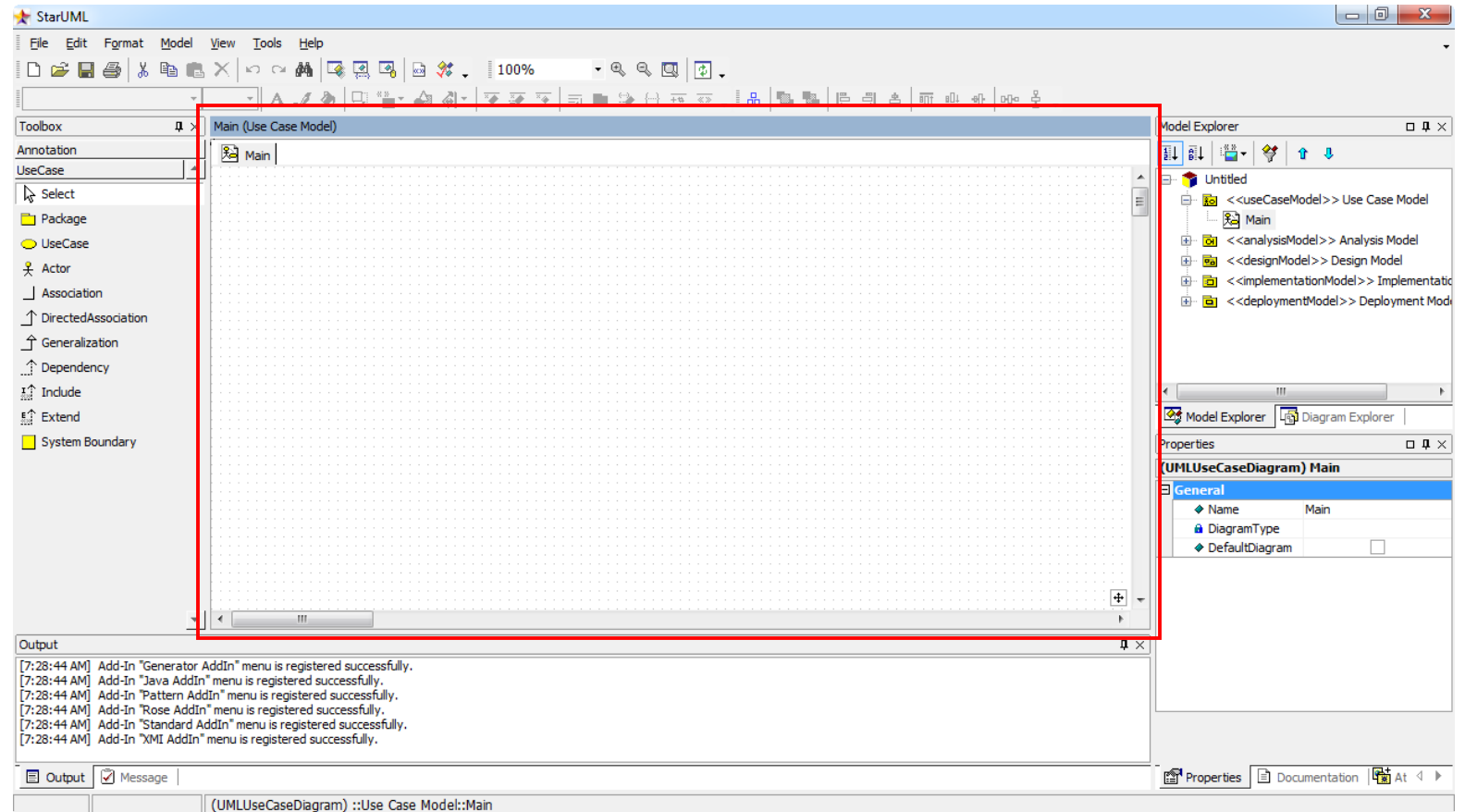
General	
Name	Main
DiagramType	
DefaultDiagram	

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2. Learn> Topic: 4.3. StarUML usage and example

- ☒ A : Text-based + Audio
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- ☐ C : Only Video

■ Drawing Space

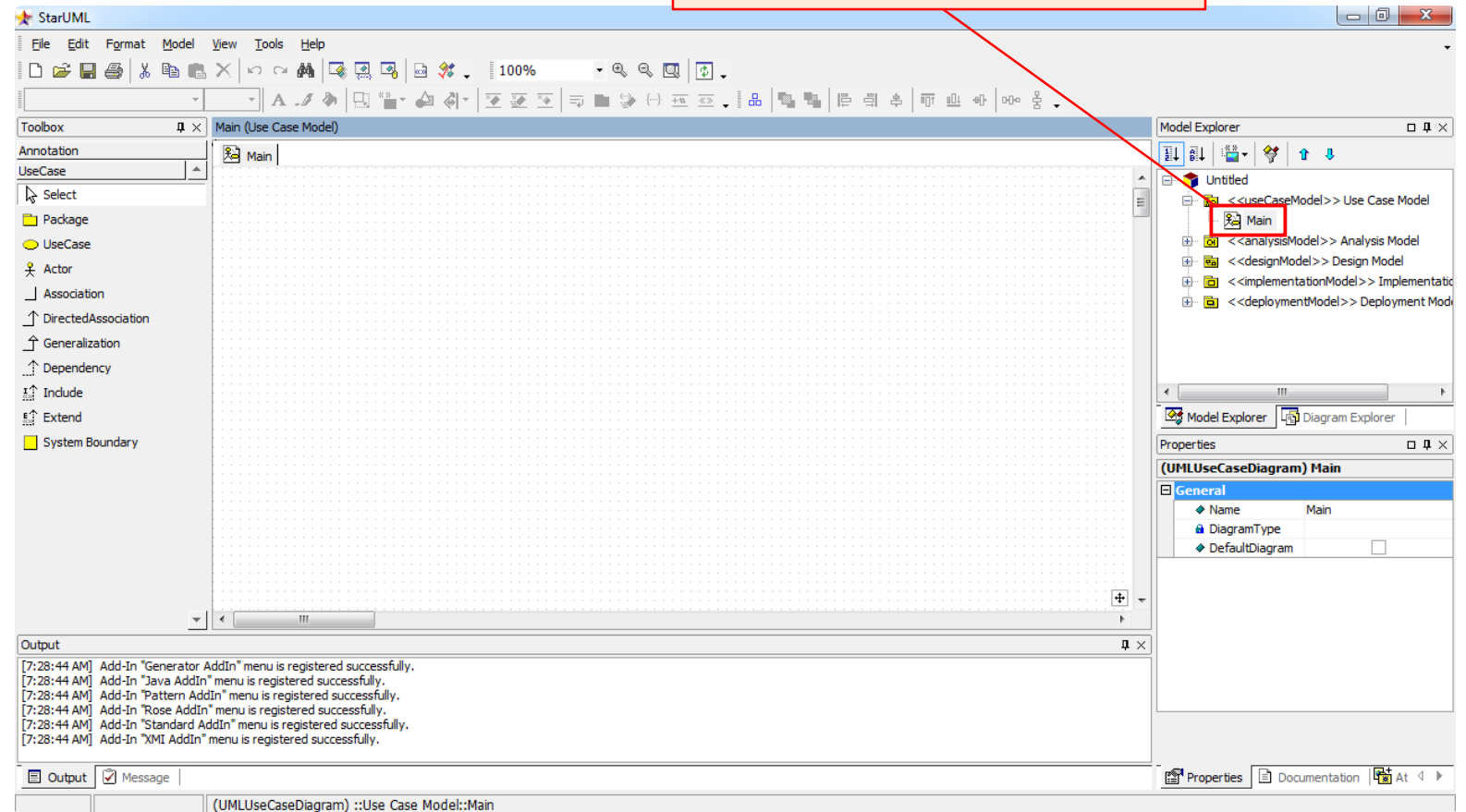


2. Learn> Topic: 4.3. StarUML usage and example

- ☒ A : Text-based + Audio
- ☐ B : Text-based + Video
- ☐ C : Only Video

■ Drawing a Component

Double Click to open diagram

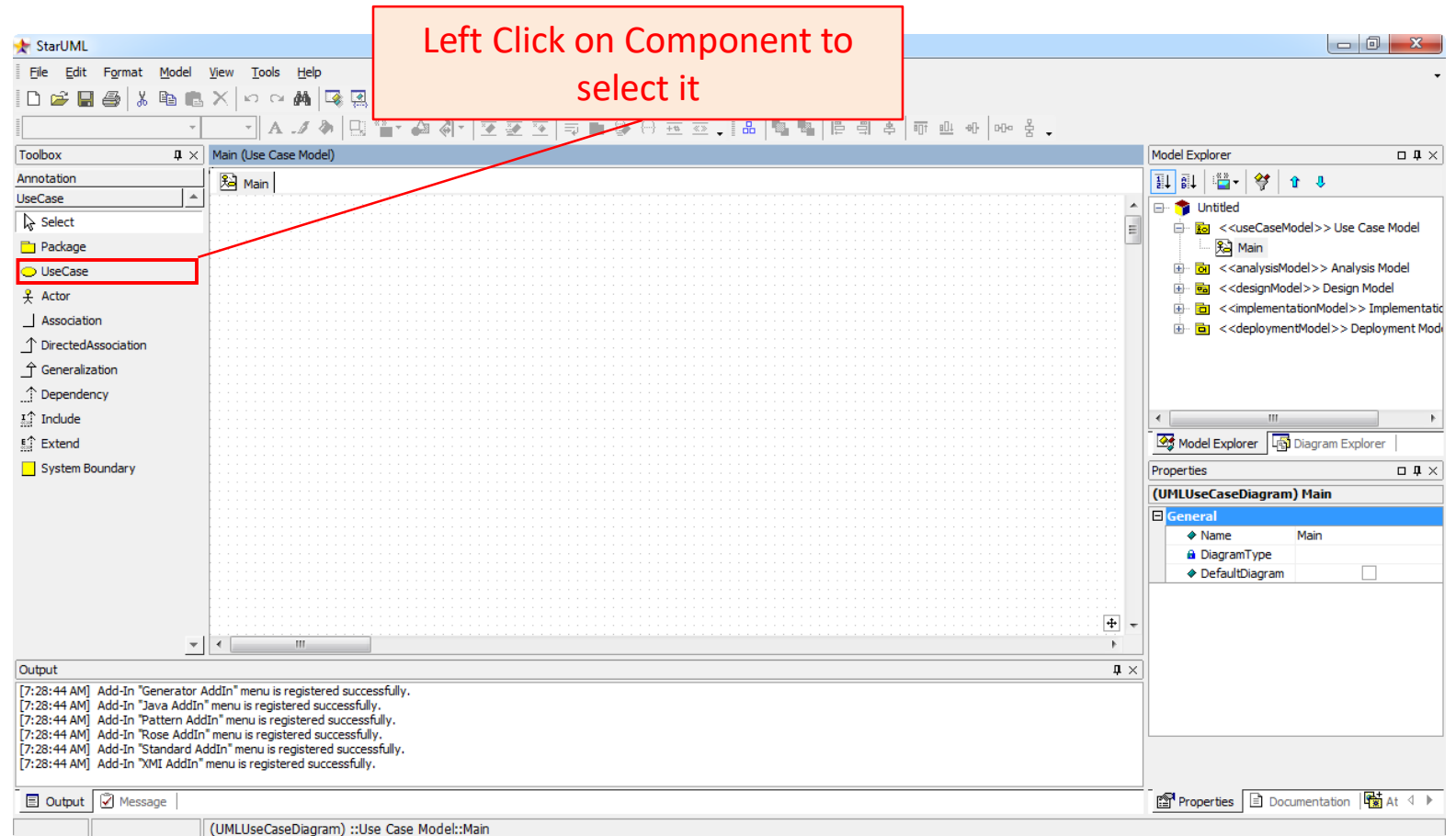


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2. Learn> Topic: 4.3. StarUML usage and example

- ☒ A : Text-based + Audio
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■ Drawing a Component

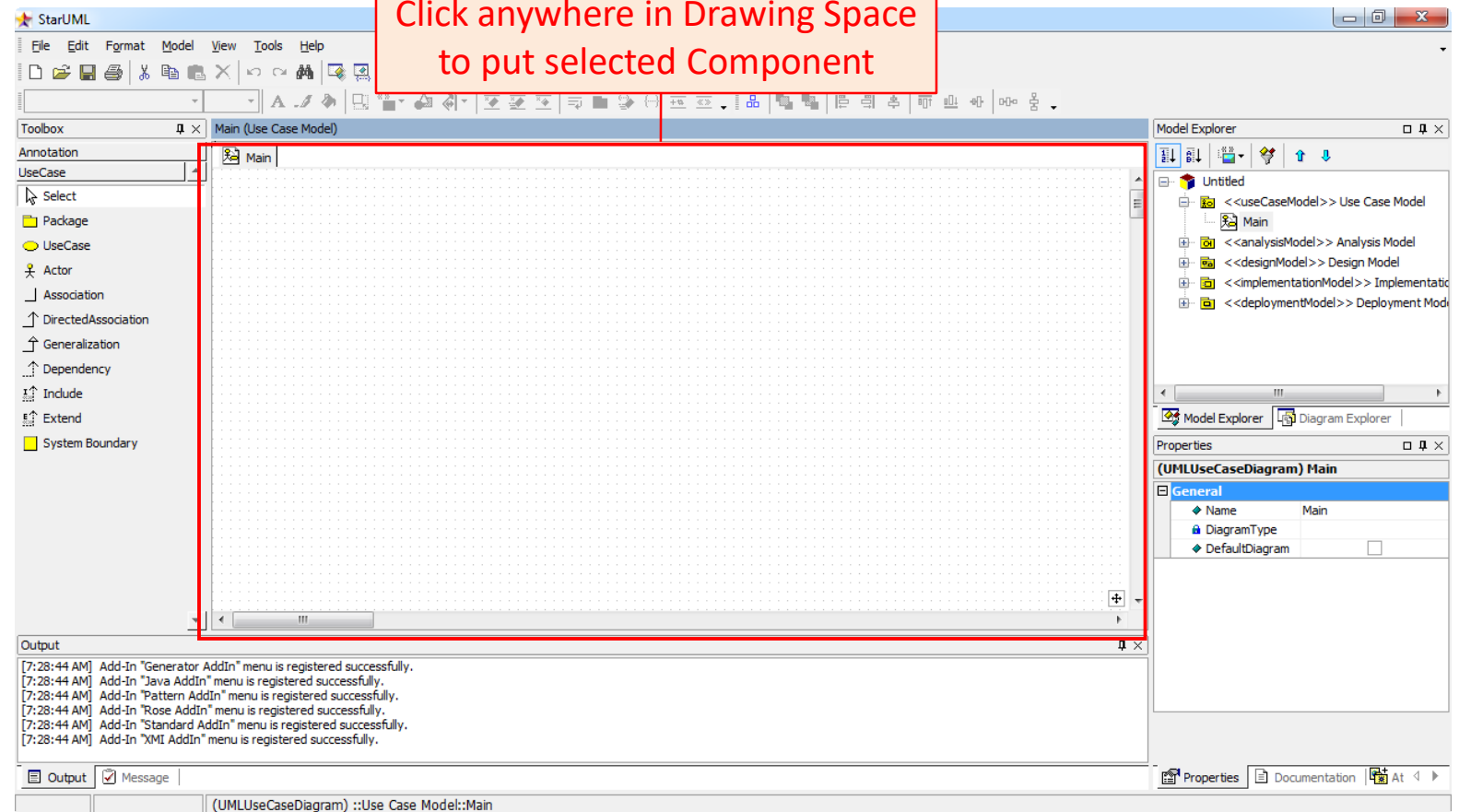


2. Learn> Topic: 4.3. StarUML usage and example

- ☒ A : Text-based + Audio
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- ☐ C : Only Video

■ Drawing a Component

Click anywhere in Drawing Space
to put selected Component



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2. Learn> Topic: 4.3. StarUML usage and example

- ☒ A : Text-based + Audio
- ☐ B : Text-based + Video
- ☐ C : Only Video

■ Drawing a Component

Input the use case name then
ENTER or click outside

The screenshot displays the StarUML application window. The main canvas shows a use case diagram with a single use case labeled 'Create blog account'. A red box highlights this use case, and a red arrow points from a text box above it to the use case. The text box contains the instruction 'Input the use case name then ENTER or click outside'. The left sidebar shows the 'Toolbox' with various UML elements like 'UseCase', 'Actor', 'Association', etc. The right sidebar shows the 'Model Explorer' with a tree view of the project structure. The bottom status bar shows the current model is '(UMLUseCase) :: Use Case Model :: Jung, Yoontae'.

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Output:

```
[7:28:44 AM] Add-in "Generator AddIn" menu is registered successfully.  
[7:28:44 AM] Add-in "Java AddIn" menu is registered successfully.  
[7:28:44 AM] Add-in "Pattern AddIn" menu is registered successfully.  
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[7:28:44 AM] Add-in "Standard AddIn" menu is registered successfully.  
[7:28:44 AM] Add-in "XML AddIn" menu is registered successfully.
```

Modified: (UMLUseCase) :: Use Case Model :: Jung, Yoontae

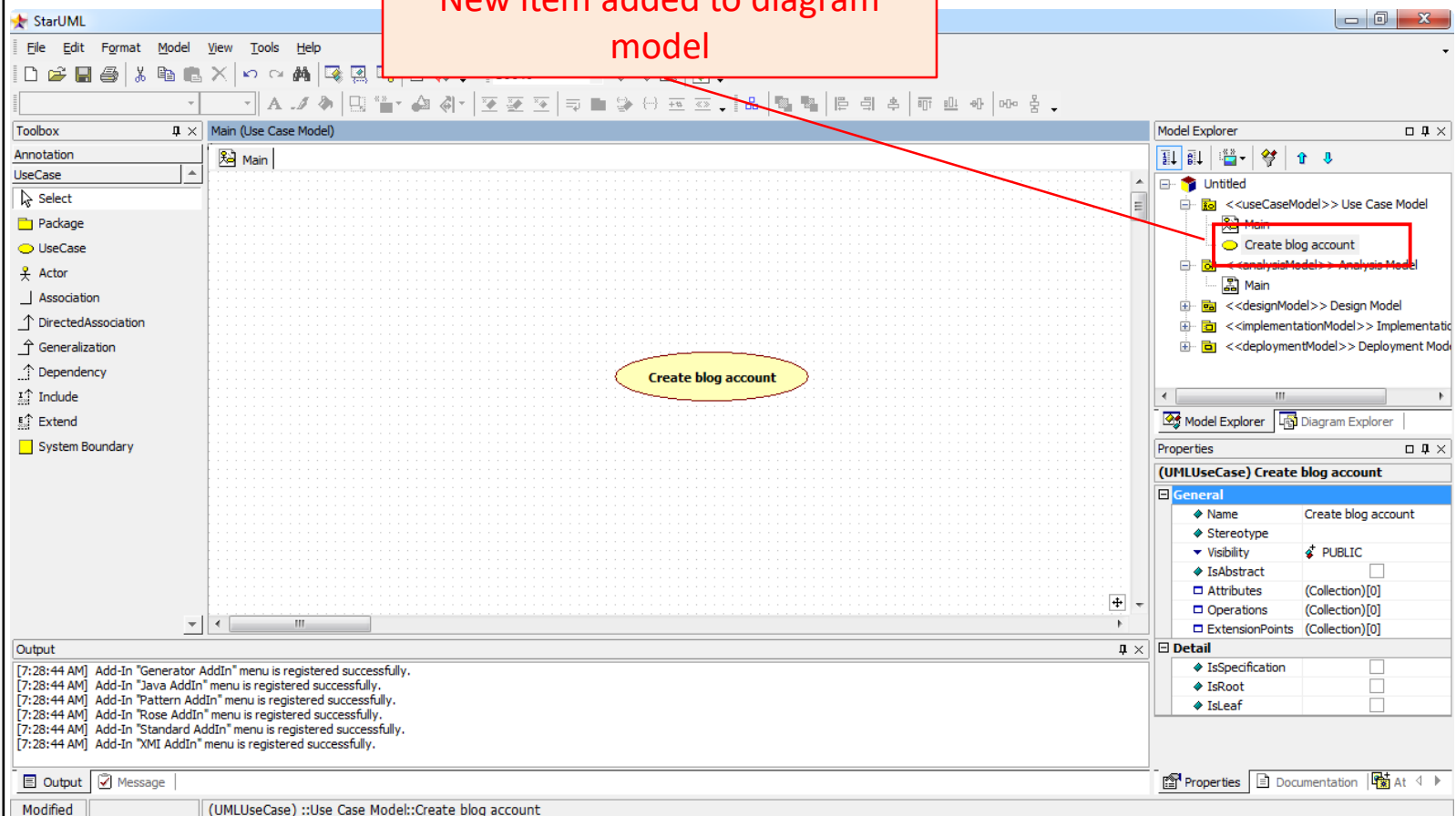
2. Learn> Topic: 4.3. StarUML usage and example

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- ☐ C : Only Video

■ Drawing a Component

New item added to diagram model

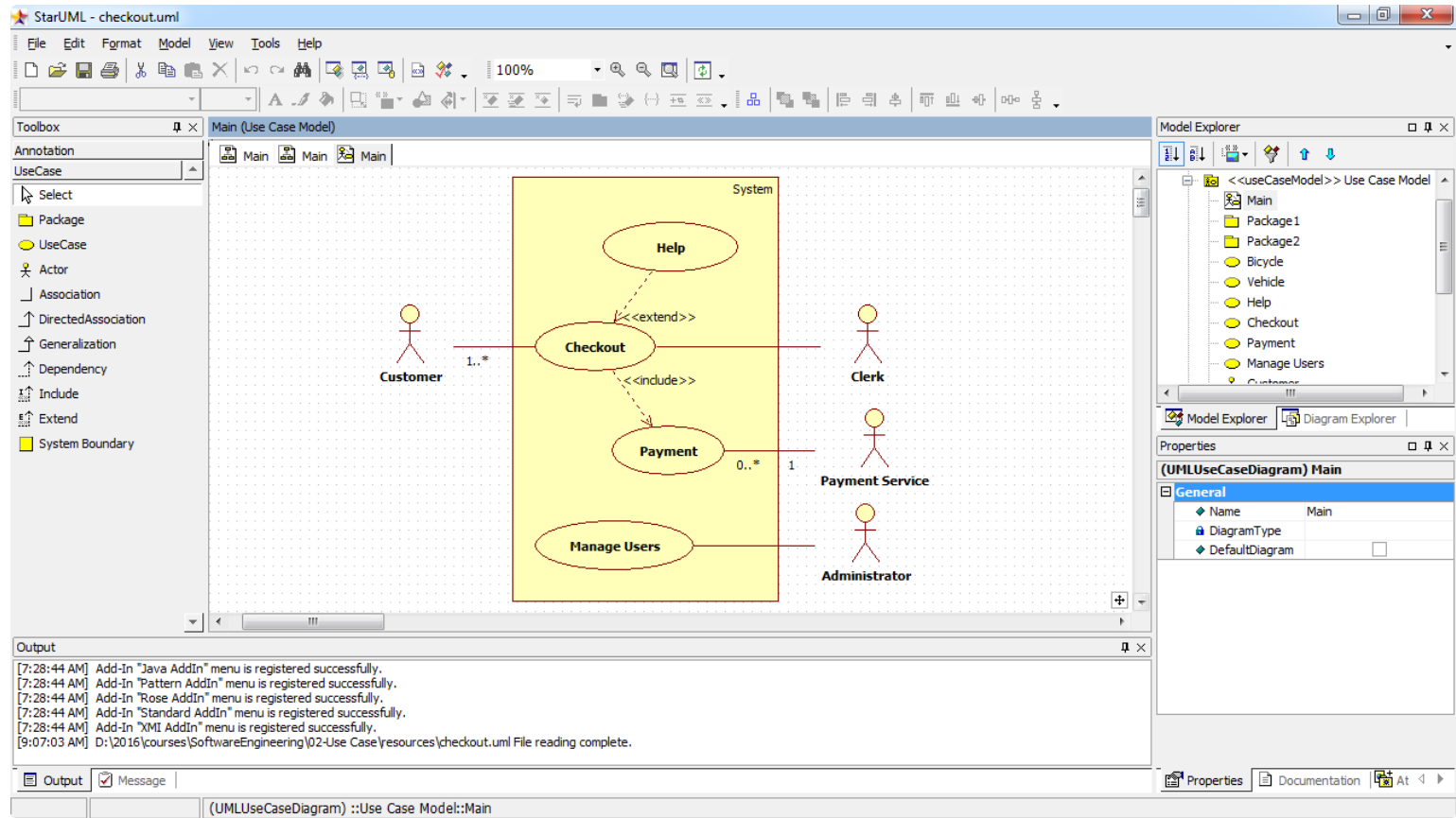
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2. Learn> Topic: 4.3. StarUML usage and example

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■ Example: Buying System



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- ☒ A : Text-based + Audio
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- ☐ C : Only Video



Project Glossary



UML & SysML Toolset

An industry standard for specifying, visualizing and documenting various aspects of software.



Advanced
Modeling
Toolset



Requirements Gathering Toolset

Identify use cases from stakeholders, write use case scenarios with Flow of Events.



Produce Requirement
Specification



Code
Engineering



Database
Design
Toolset



Document
Production



Task management



Wireframe

Design user experience (UX) by creating wireframes. Tell story by combining wireframe with use case scenarios.















Process
Simulation

2. Learn> Topic: 5.1. Versions of Visual Paradigm

- ☒ A : Text-based + Audio
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☐ C : Only Video

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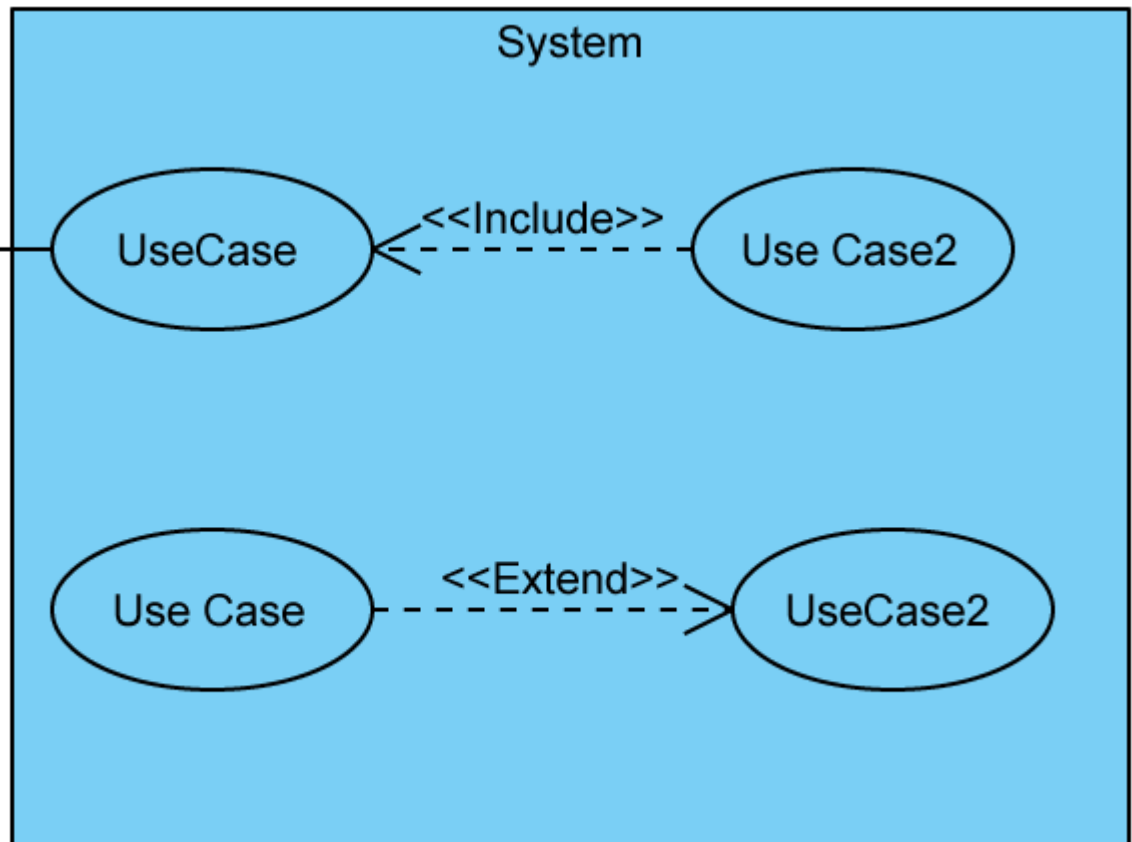
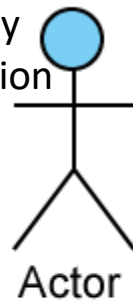
		Modeler	Standard	Professional	Enterprise
	UML & SysML Toolset	NEW	✓	✓	✓
	Glossary Management	Enhanced	✓	✓	✓
	BPMN Toolset		✓	✓	✓
	Collaborative Modeling	Enhanced	✓	✓	✓
	Code Engineering	Enhanced	✓	✓	✓
	Database Design Toolset	Enhanced	✓	✓	✓
	Advanced Modeling Toolset	Enhanced	✓	✓	✓
	Document Production	NEW	✓	✓	✓
	Requirements Gathering Toolset	NEW		✓	✓
	Wireframe			✓	✓
	Generate Requirement Specification			✓	✓
	Task management	NEW		✓	✓

2. Learn> Topic: 5.2. Use Case representation in Visual Paradigm

(1) Learning Contents

- ☒ A : Text-based + Audio
- ☐ B : Text-based + Video
- ☐ C : Only Video

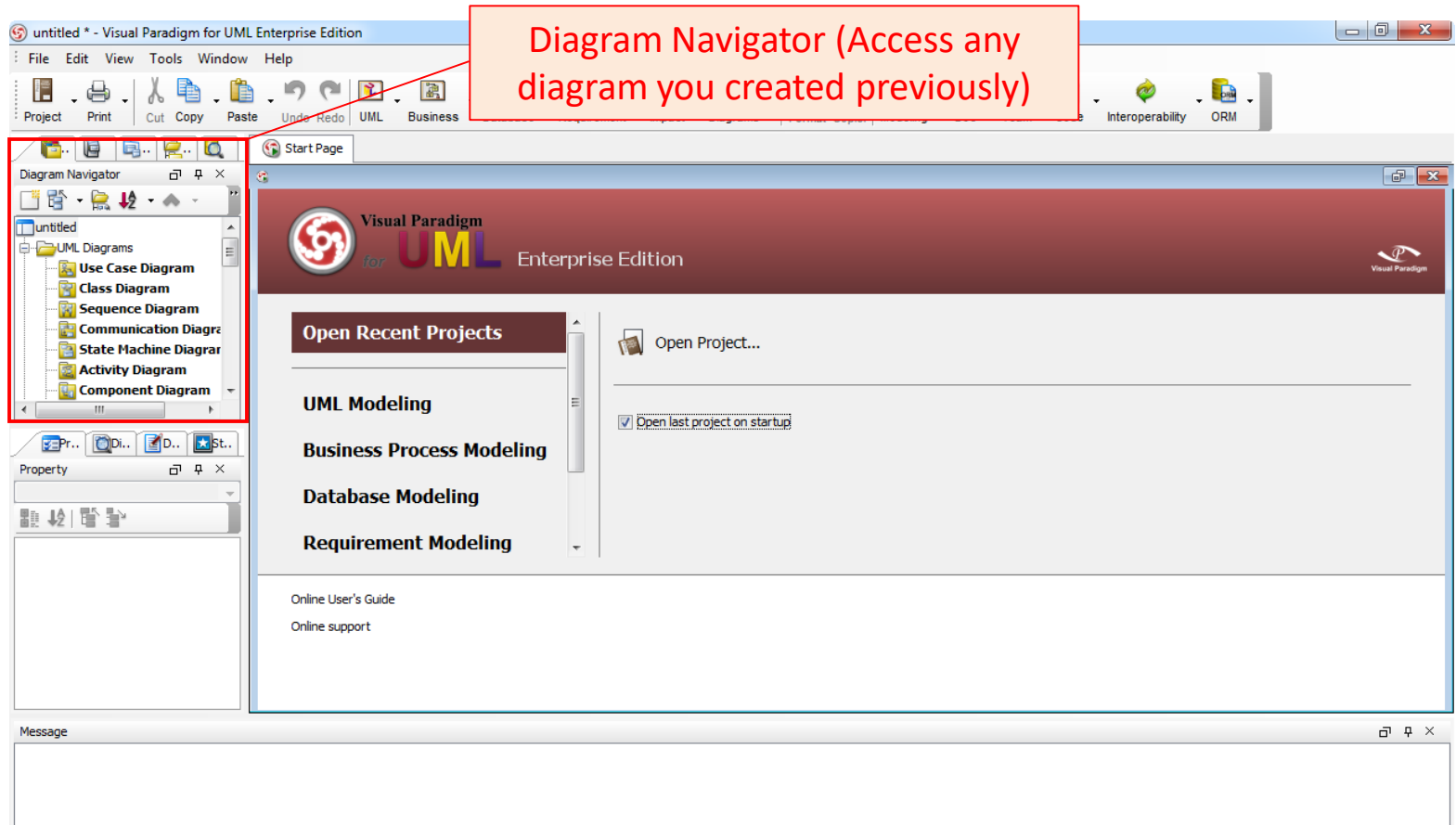
- Use Case
- Association
- Actor
- System
- Include
- Extend
- Dependency
- Generalization



2. Learn> Topic: 5.3. Visual Paradigm Usage and Example

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- ☐ B : Text-based + Video
- ☐ C : Only Video

■ Startup page

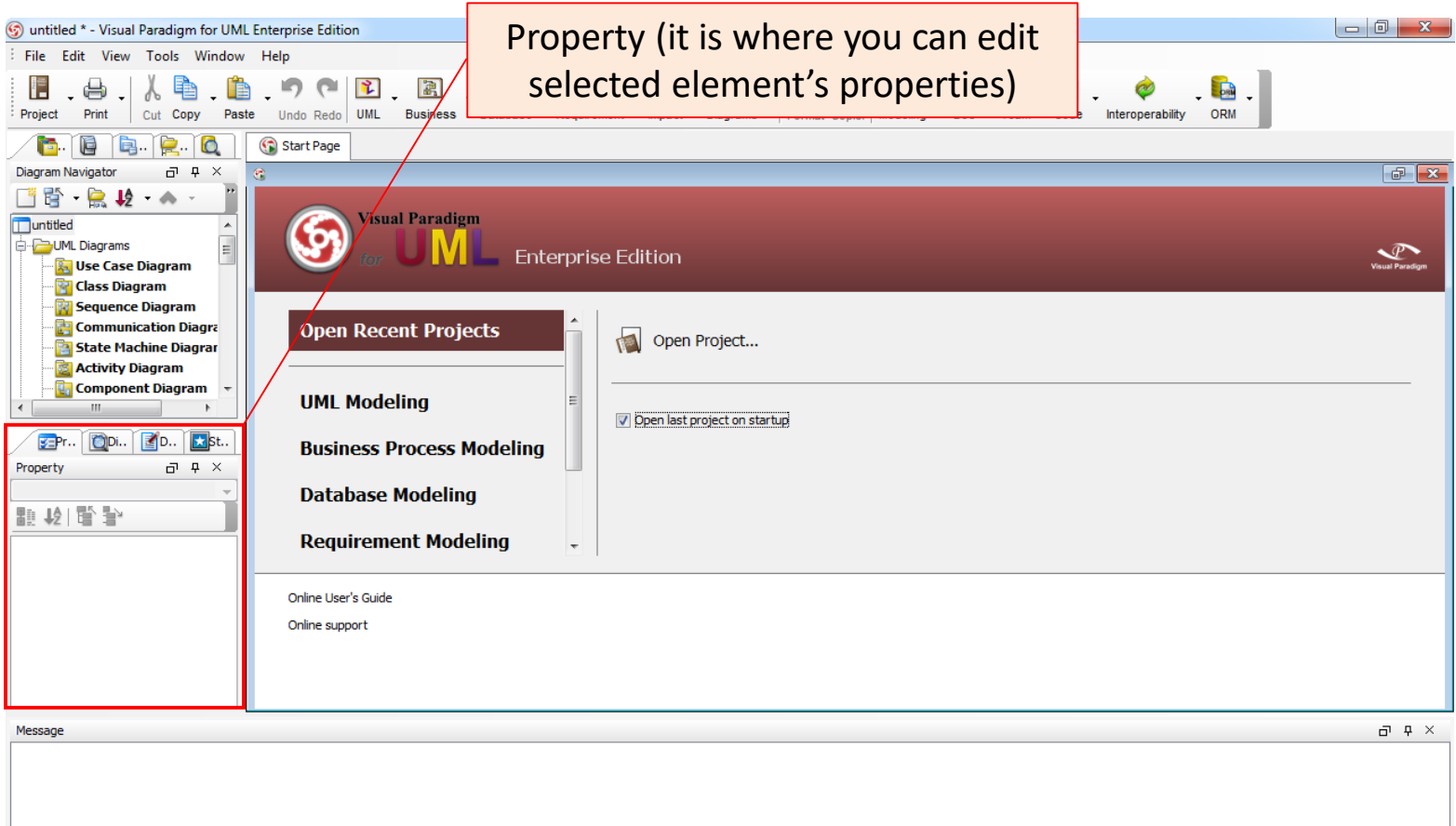


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2. Learn> Topic: 5.3. Visual Paradigm Usage and Example

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- ☐ B : Text-based + Video
- ☐ C : Only Video

■ Startup page

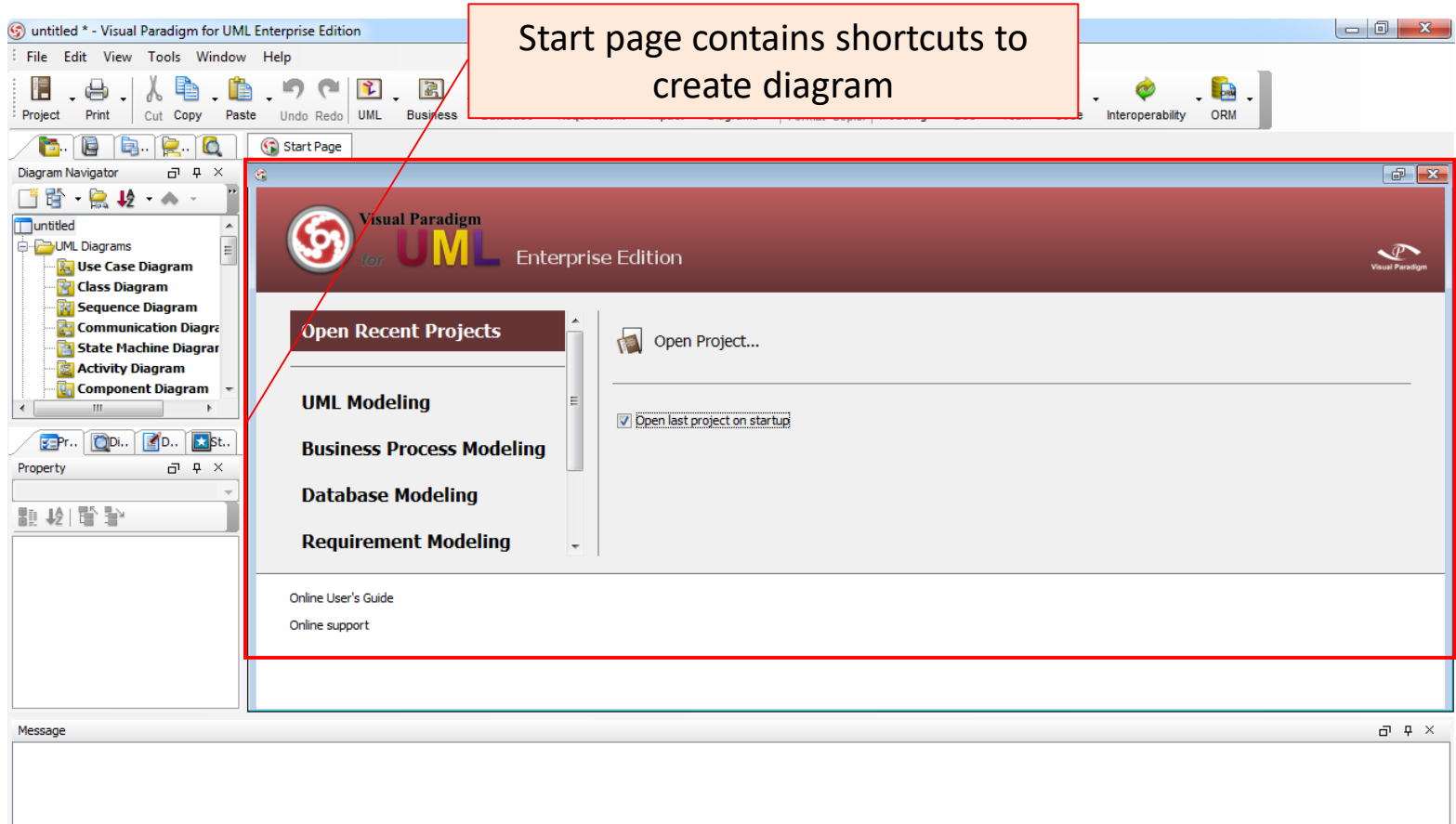


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2. Learn> Topic: 5.3. Visual Paradigm Usage and Example

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- ☐ C : Only Video

■ Startup page

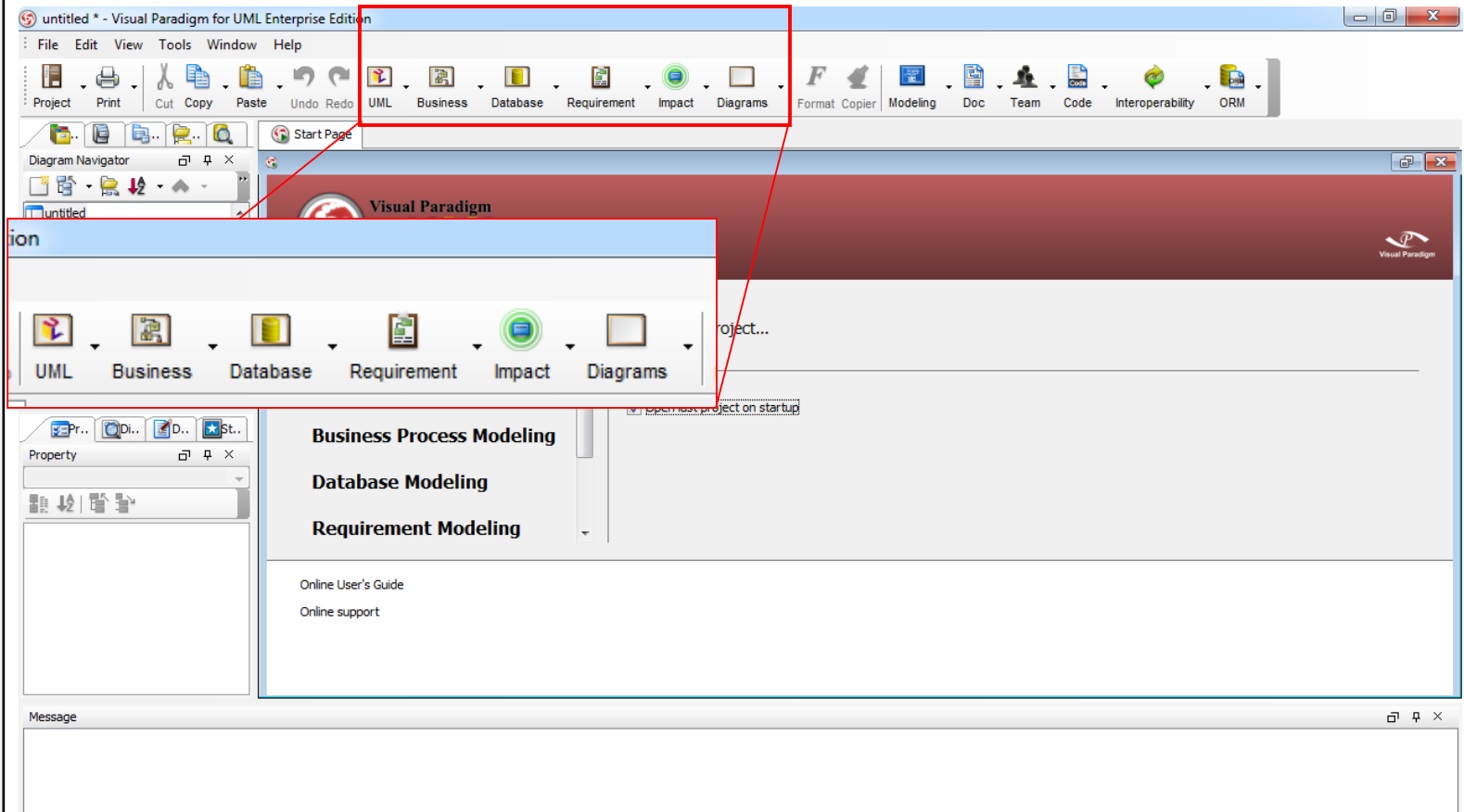


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2. Learn> Topic: 5.3. Visual Paradigm Usage and Example

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- ☐ C : Only Video

■ Shortcut to create diagram

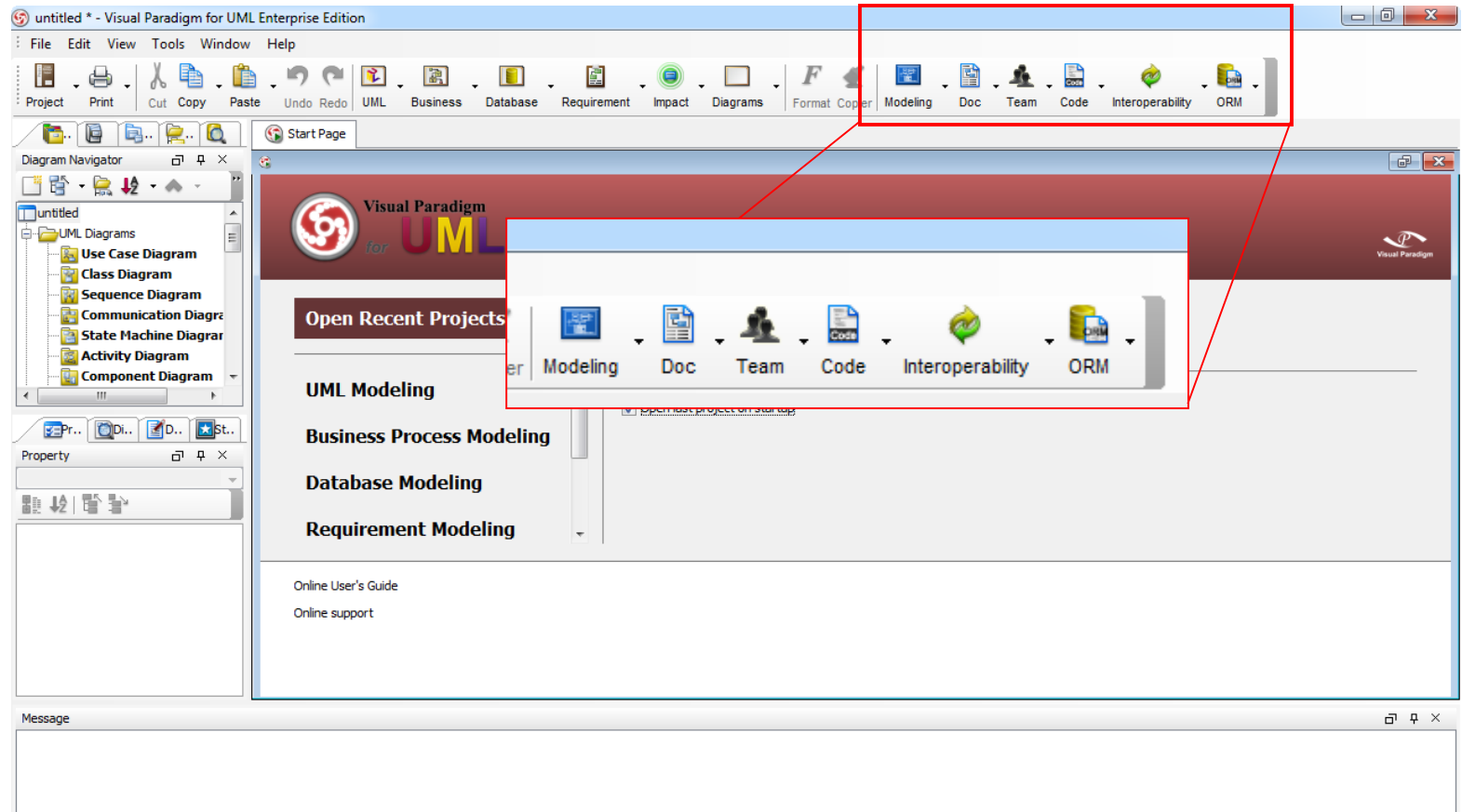


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2. Learn> Topic: 5.3. Visual Paradigm Usage and Example

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- ☐ C : Only Video

■ Engineering life cycle tools



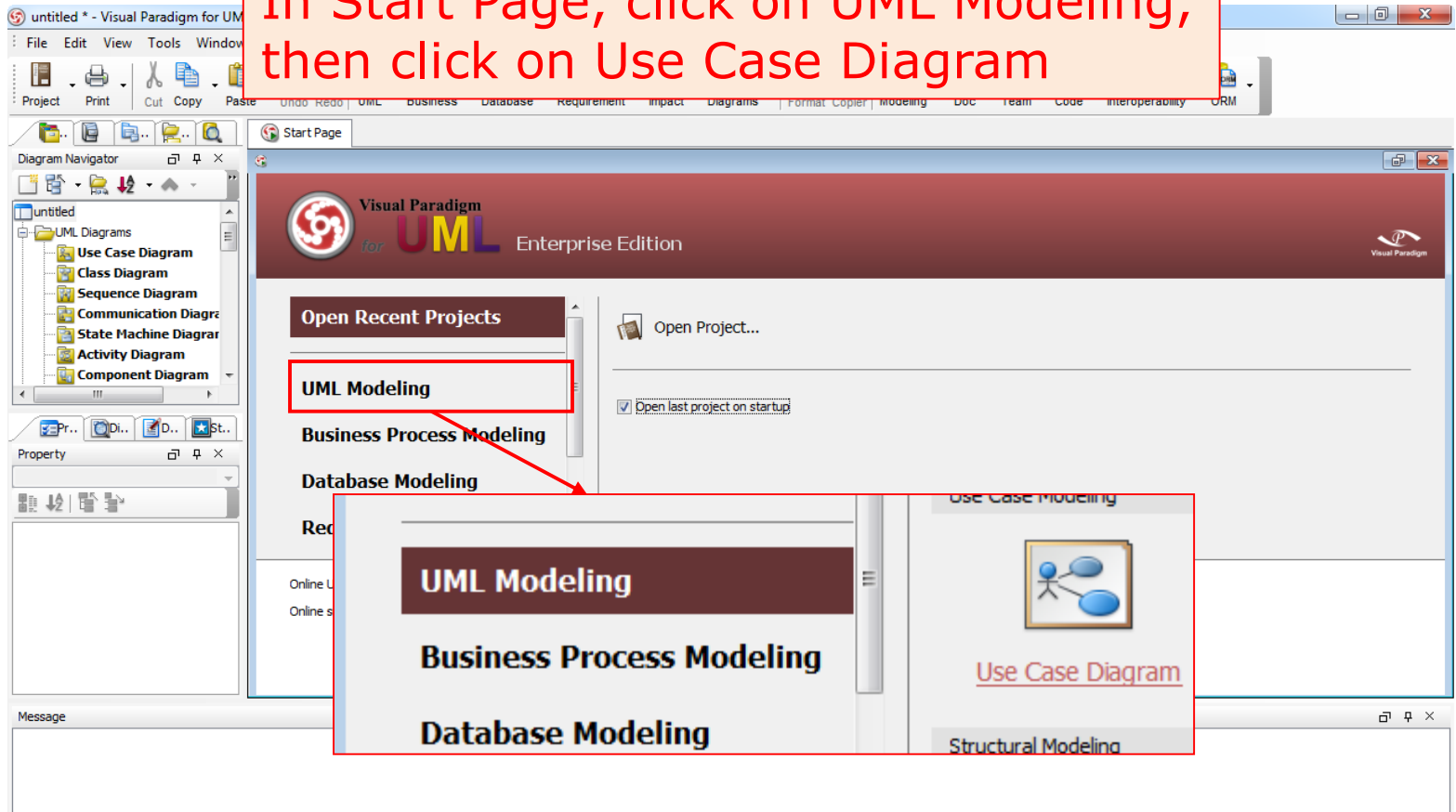
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2. Learn> Topic: 5.3. Visual Paradigm Usage and Example

- ☒ A : Text-based + Audio
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- ☐ C : Only Video

■ Starting Use Case Diagram

In Start Page, click on UML Modeling,
then click on Use Case Diagram



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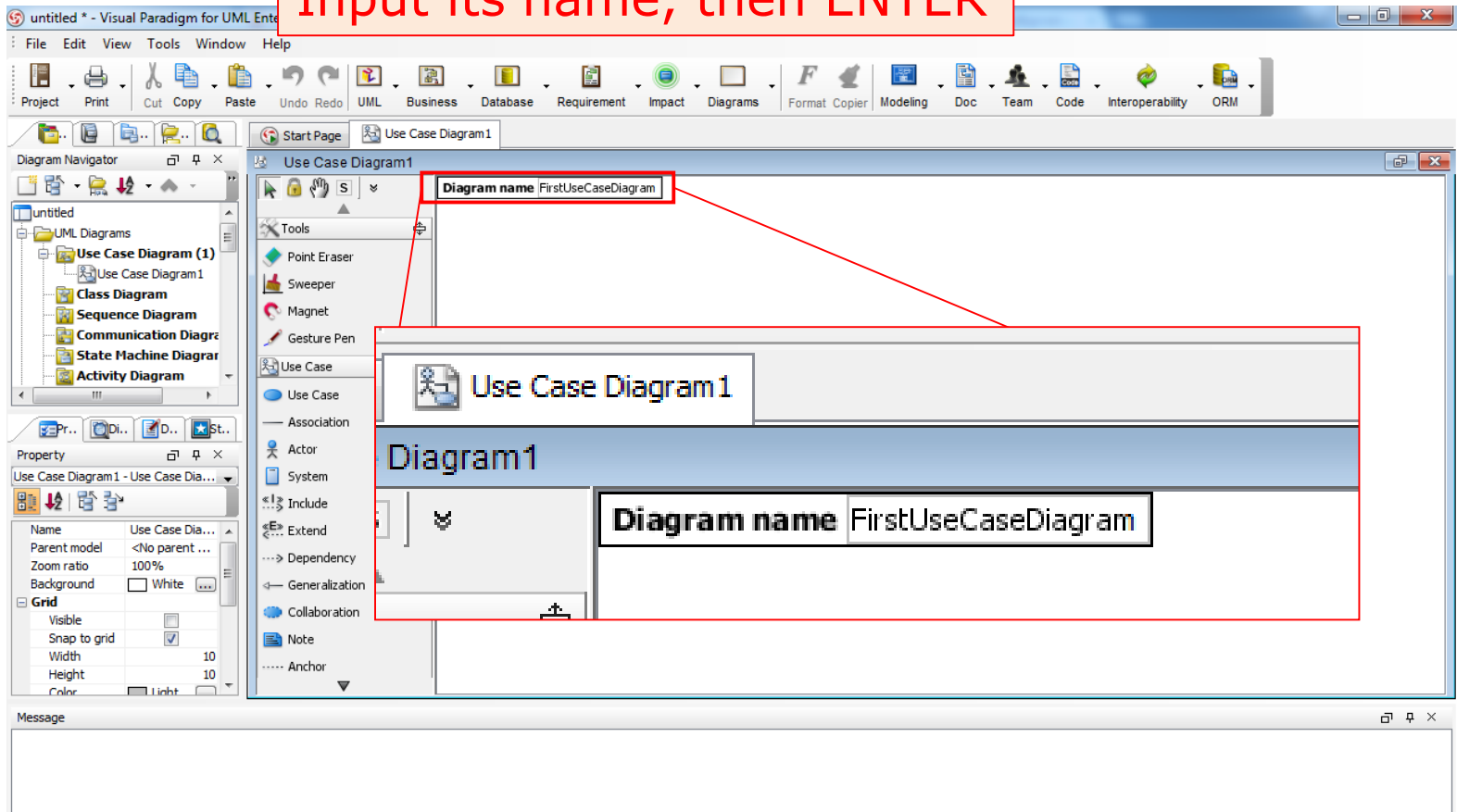
2. Learn> Topic: 5.3. Visual Paradigm Usage and Example

- ☒ A : Text-based + Audio
- ☐ B : Text-based + Video
- ☐ C : Only Video

■ Starting Use Case Diagram

Input its name, then ENTER

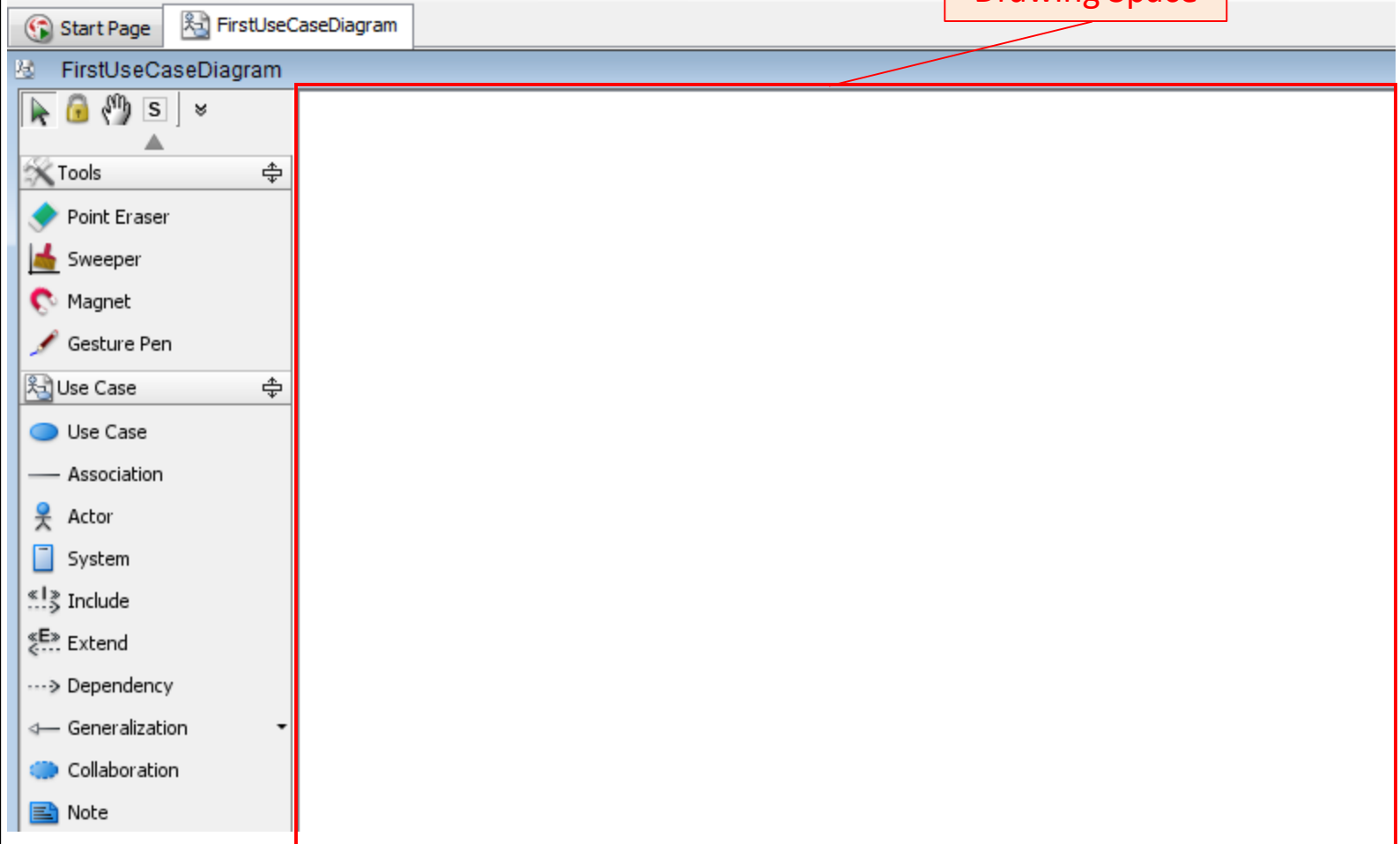
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■ Drawing Use Case Diagram

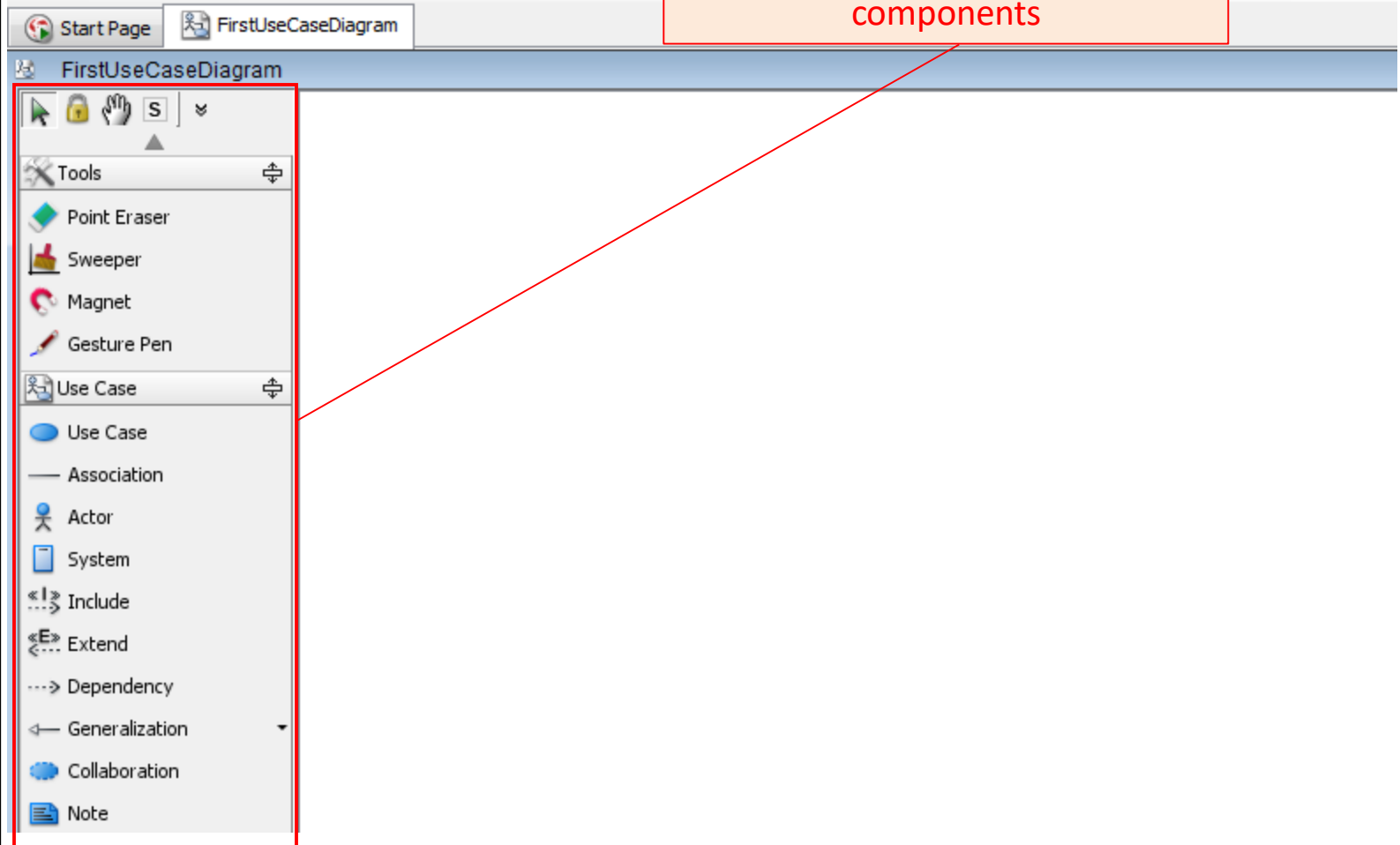


2. Learn> Topic: 5.3. Visual Paradigm Usage and Example

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- ☐ C : Only Video

■ Drawing Use Case Diagram

Drawing Tools and Use Case components

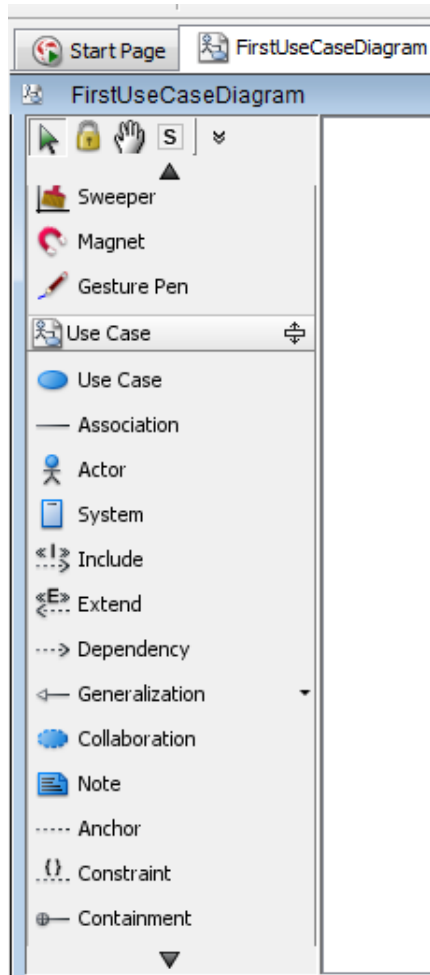


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- ☐ C : Only Video

■ Drawing Use Case Diagram



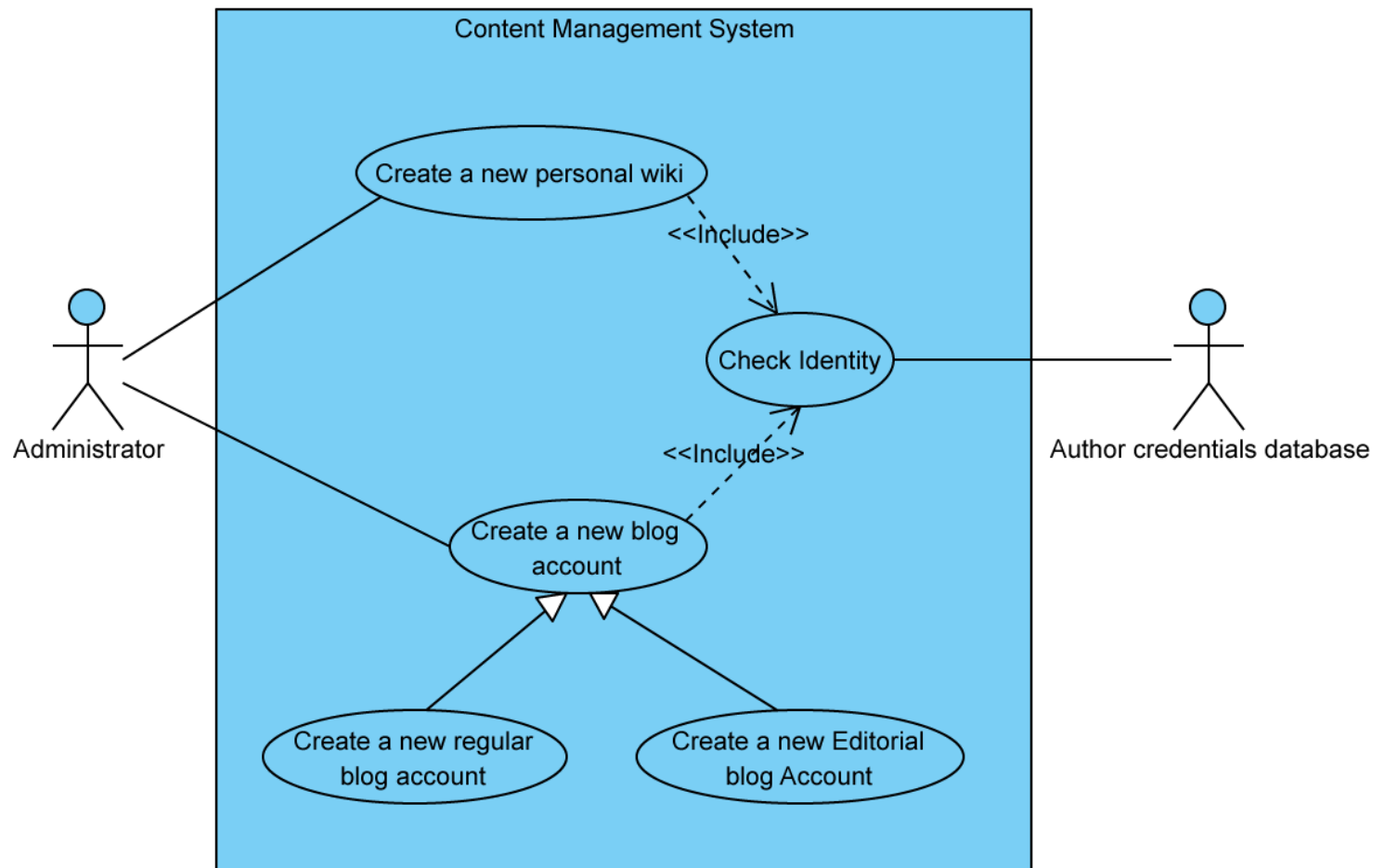
Drag a Use Case Component to drawing space
Or Click a Use Case Component and then
click on Drawing Space.
Then, input its Use Case name.



2. Learn> Topic: 5.3. Visual Paradigm Usage and Example

- ☒ A : Text-based + Audio
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■ Example



3. Test

Question	Possible answers	Correct Answer
1. Choose UML drawing tools you already learnt:	a) StartUML b) StarUML c) Virtual Paradigm d) Visual Paradigm	b) StarUML d) Visual Paradigm
2. Completing blank field:	Some actors are related to each other (.....)	generalization
3. Choose a name that is not Use Case Component:	a) Generalization b) Specific Case c) Association d) Expand e) Include f) System	d) Expand
4. Use Case Diagram is used to represent:	a) 1 Requirement b) Logical view c) All Requirements d) Sub System e) Process view	a) 1 requirement c) All Requirements
5. Which UML drawing tool that we can name the system box and place the image?	a) StarUML b) Visual Paradigm	b) Visual Paradigm

4. Practice

- ☐ A : Fill in the blank
- ☐ B : Short answer question
- ☐ C : Multiple Choice

- Feedback type
- ☐ A : Text-based short answer
 - ☐ B : Text-based short answer and more information
 - ☐ C : Video based feedback

Practice

No.	Exercise	Solution
1	Using StarUML to draw Use Case Diagram representing requirements A.1 and A.2 in this course.	
2	Using StarUML to draw Use Case Diagram representing requirements bellow: <ul style="list-style-type: none">- ATM system (attached in Moodle)- Alarm clock system (attached in Moodle)	
3	Using Visual Paradigm to draw Use Case Diagram representing requirements bellow: <ul style="list-style-type: none">- ATM system (attached in Moodle)- Alarm clock system (attached in Model)	

5. Outro > 5.1 Summarize

Please give a lesson summary.

Each topic can be summarized into a sentence, diagram, or even a word.

- ☒ A : Text-based + Audio
- ☐ B : Text-based + Video
- ☐ C : Only Video

Summarize

- Use Case is not a diagram but situation of what user need.
- Use Case components include Actor, System boundary, Use Case.
- Use Case relationship includes Association, Generalization, Include, Extend.
- StarUML version 1 is free and open source, but version 2 is close source.
- Visual Paradigm Community Edition that is free, but other four editions are paid.
- Both StarUML and Visual Paradigm are UML drawing tool that helps you draw Use Case representation of the project or Requirements.

Provide references if you think the students need.

Reference

- Miles, R. (2006). Learning UML 2.0. O'Reilly
- Chonoles, M. & Schardt, J. (2003). UML 2 for Dummies. Wiley Publishing
- <http://www.visual-paradigm.com/features/>
- <http://staruml.io/support>
- <http://staruml.sourceforge.net/v1/documentations.php>
- <http://www.math-cs.gordon.edu/courses/cs211/ATMExample/UseCases.html>

This is the end of the lesson.
Ending message and introduction to next lesson including lesson title and topics should be given.

- ☒ A : Text-based + Audio
- ☐ B : Text-based + Video
- ☐ C : Only Video

Next Lesson Title	Activity Diagram <ul style="list-style-type: none">1. Activity Diagram Essentials2. Activities and Actions3. Decisions and Merges4. Doing Multiple Tasks at the Same Time5. Time Event
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