CMP5354
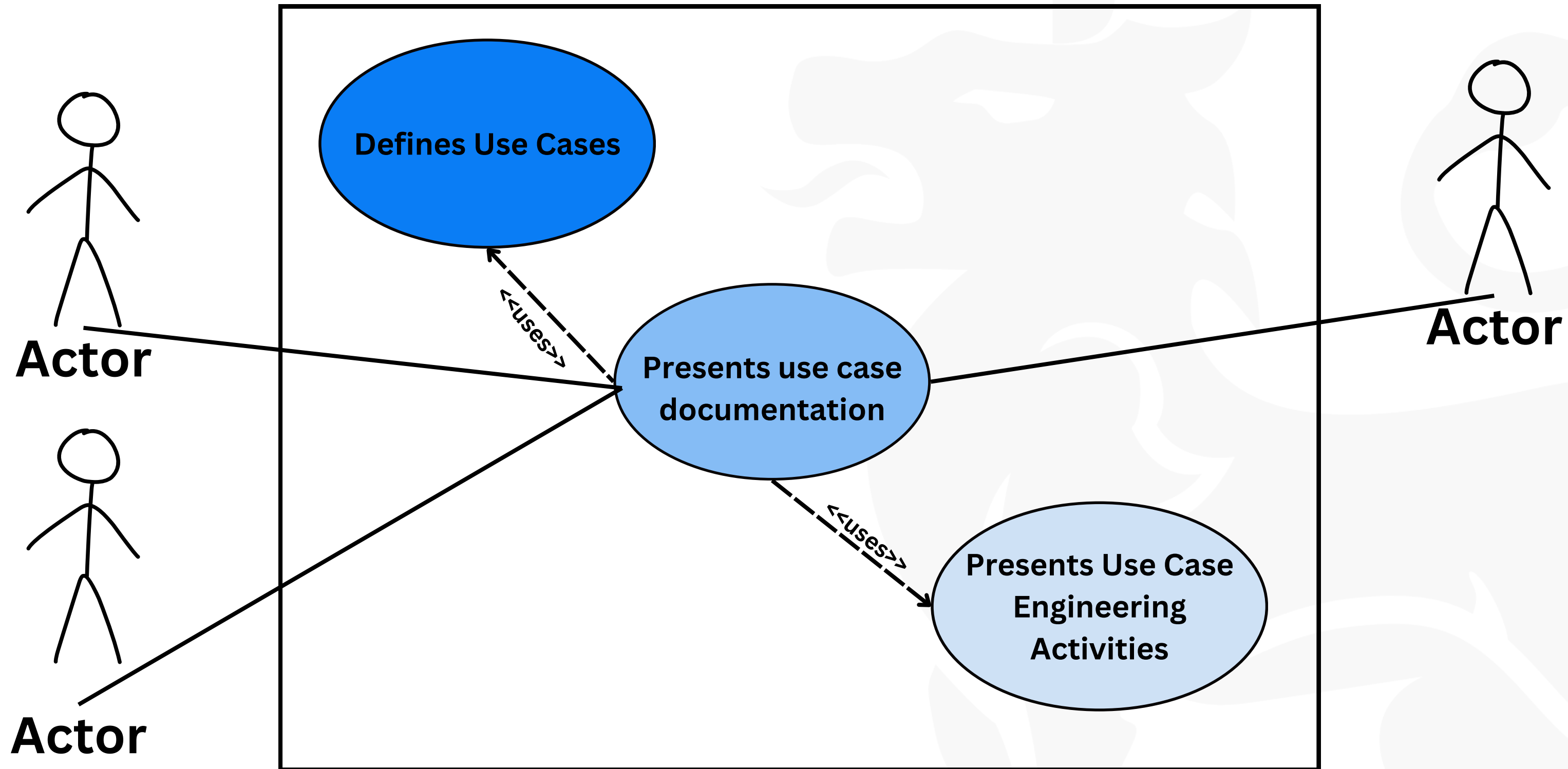# Software Design
Use Cases

UseCaseDefinition

A structured representation of a functional requirement focussing on the functionality of the system from the user's perspective

Functional Requirements vs. Use Cases

Functional Requirements

- **Example:** The system must allow users (students and staff) to log in using a username and password.

- Describes what the system does.
- The functional requirement can be used different by different target users (e.g., one type of user can be allowed to attempt logging in once, another might be allowed multiple attempts)

Use Cases

- **Example:** The student logs into the system.

- Describes what the user does.
- Specific to a single user type.
- It generically covers all the possible scenarios related to a specific functional requirement.

Linking Use Cases to
Final Year Project/Assessment Case Studies

Project Details #520006

IBM

Title: Artificially Intelligent Journalist
Topic Areas: Artificial Intelligent, Natural Language Processing
Tags: IBM

Business Case: Fake news is a big problem and users are losing the ability to trust pieces of content they read online or in the media. Users can often be influenced by articles that play on emotional triggers or portray certain entities/characters in a certain way. For an end user, it can be difficult to see a balanced view of the news surrounding a particular topic and news platforms such as Facebook wish to remain impartial on the content they display.

Research Problem: Create a cross publisher, cross platform view of news content related to a specific topic. This system would be able to provide balanced selection of articles around a particular topic, to give the reader informed articles providing a 'for/against' view.

Technologies: Within your research explore and discuss available alternative technologies in addition to the recommended ones.

- Watson Semantic Analysis [Recommended]
- Azure Text Analysis [Alternative]
- Amazon Comprehend [Alternative]

Skills Needed:

- Semantic Feature Analysis
- Natural Language Processing
- AI Modelling

Which sub-section(s) in this brief can be used to derive use cases?

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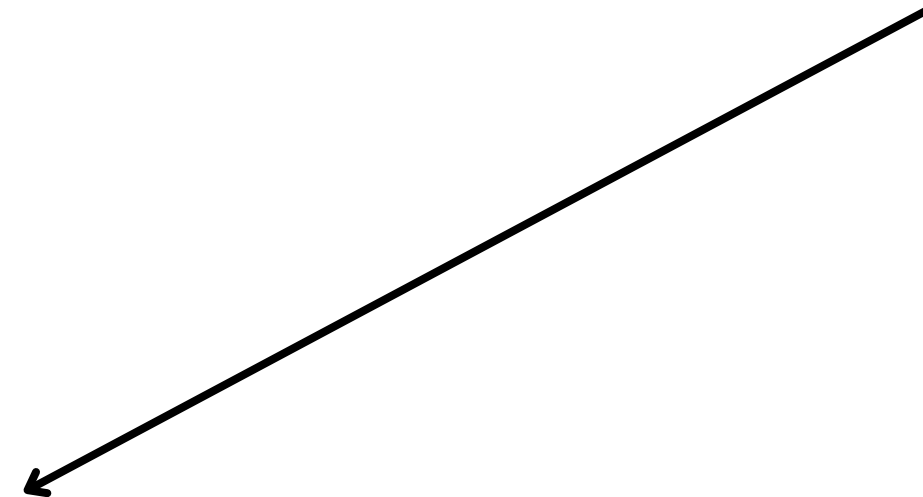
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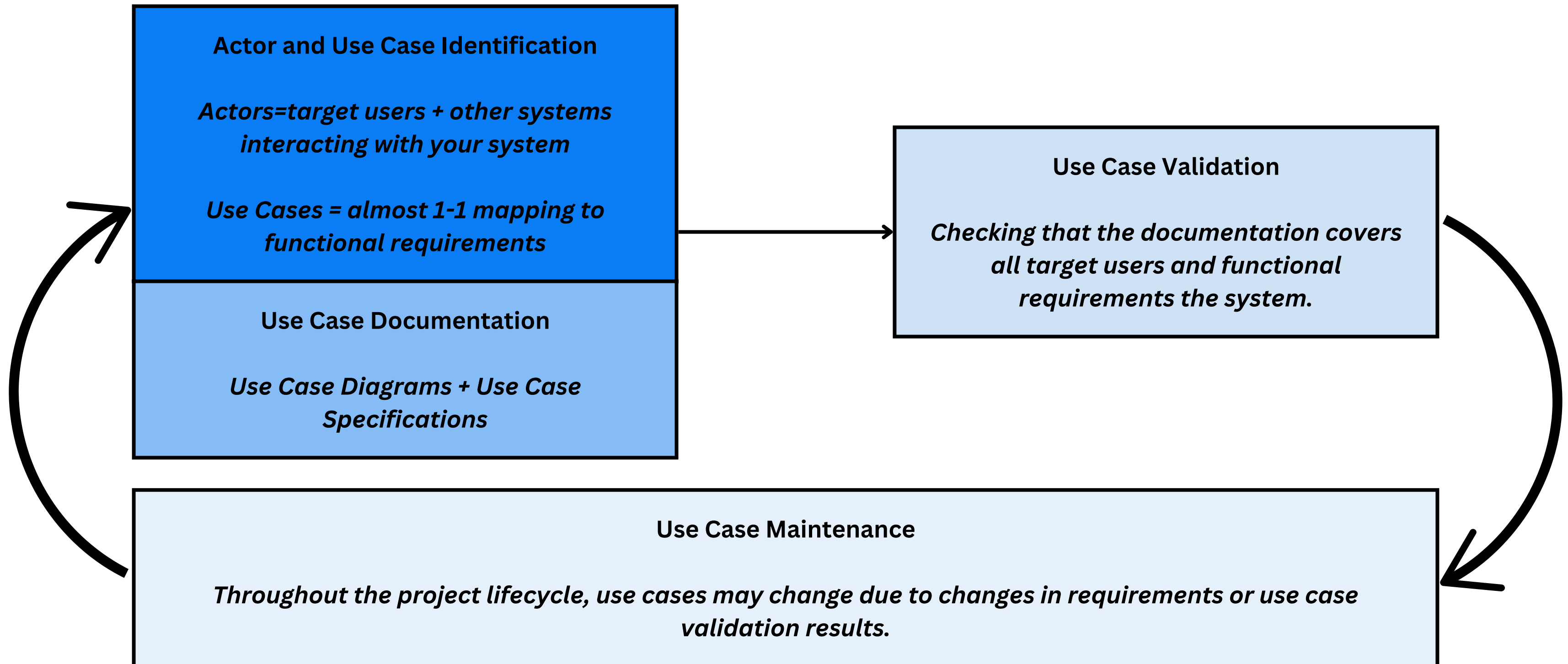- Natural Language Processing
- AI Modelling

Which sub-section(s) in this brief can be used to derive use cases?

UseCaseEngineeringDefinition

The process of identifying, documenting, and maintaining the use cases as a technique within requirements engineering.

Use Case Engineering Activities

Actor and Use Case Identification

Actors=target users + other systems interacting with your system

Use Cases = almost 1-1 mapping to functional requirements

Use Case Documentation

Use Case Diagrams + Use Case Specifications

Use Case Validation

Checking that the documentation covers all target users and functional requirements the system.

Use Case Maintenance

Throughout the project lifecycle, use cases may change due to changes in requirements or use case validation results.

Actor and Use Case Identification

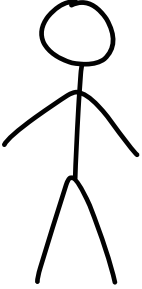| Functional Requirement ID	Functional Requirement Description
FR1	The system must display a clear, balanced breakdown of articles providing 'for' and 'against' perspectives on any news topic
FR2	The system must highlight articles designed to evoke strong emotional reactions, allowing users to be more aware of manipulative content.
FR2.1	The system should have red, amber system to indicate highly triggering and moderately triggering articles.
FR3	The system must provide concise summaries of the key points for/against on specific topics for users who want quick insights without reading full articles
FR4	The system allow users to create accounts and it must store and manage user account information securely.

Actors: **Use Cases:**
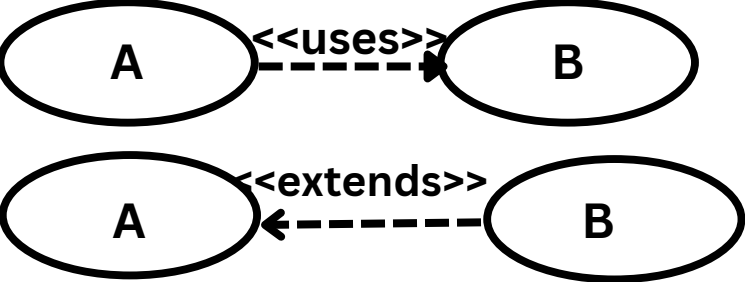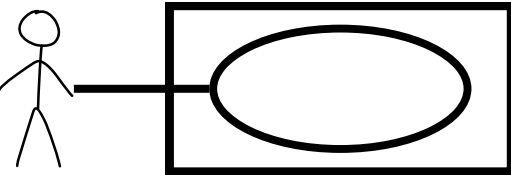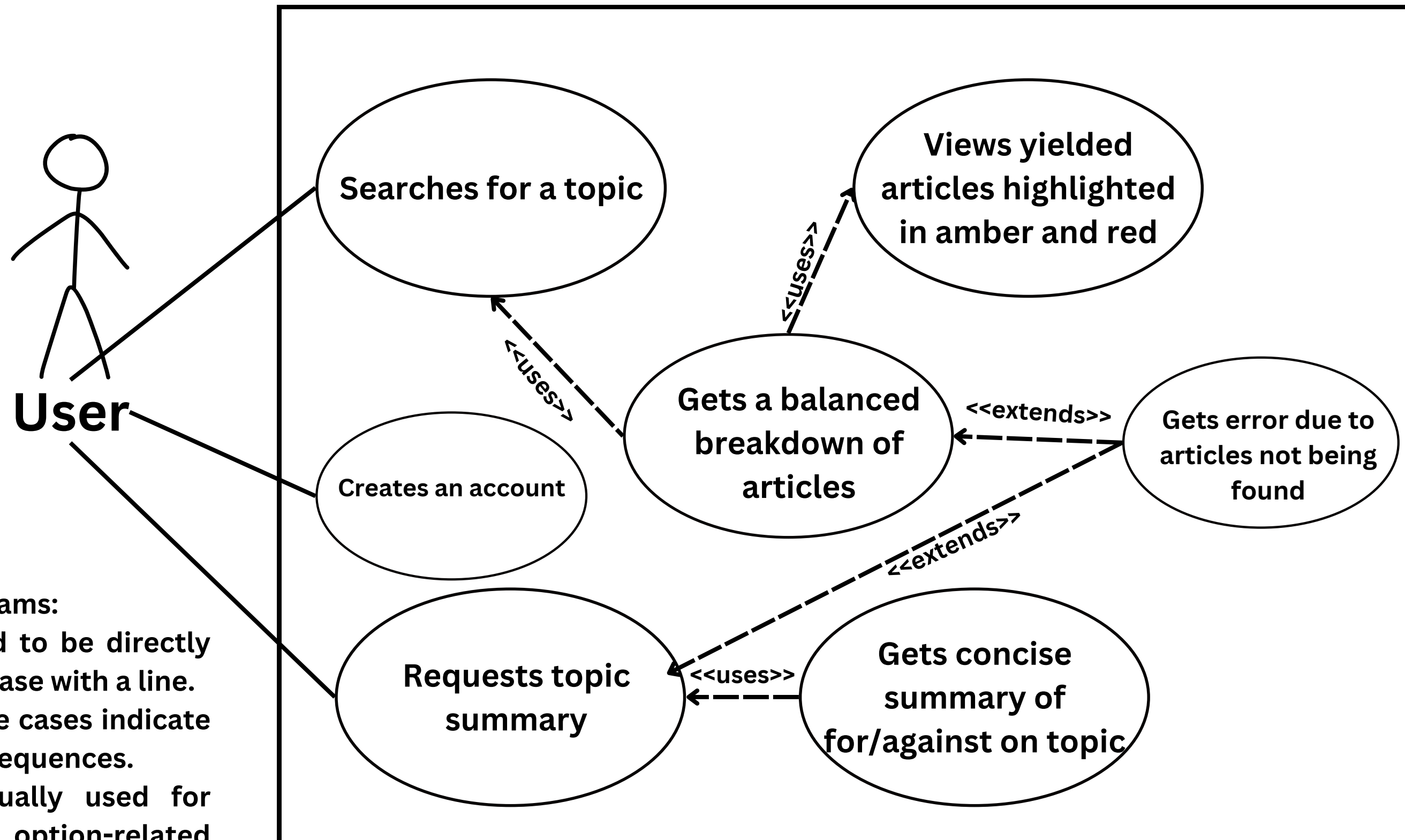
- User
  - User searches for a topic and gets balanced breakdown of articles. -- **FR1**
  - User views yielded articles highlighted in amber and red. -- **FR2**
  - User requests topic summaries through a search bar and gets a concise for/against summary. -- **FR3**
  - User creates an account on the platform. -- **FR4**

Documentation - Use Case Diagrams

Use Case Diagram Notation

Element	Definition	Notation
Actor	A labelled stick figure corresponding to each target user (i.e. human) or other systems that interact with your system. The label has to be consistent with the naming used in the requirements table.	Actor
Use Case	A circle corresponding to each use case or part of a use case linked directly or indirectly to the actor using it. Each circle has to have a verb phrase (e.g. searches for topics).	Searches for...
Uses/Extends arrows	A <<uses>> labelled dashed arrow shows: use case A depends on use case B. An <<extends>> labelled dashed arrow shows: use case B can optionally be needed by use case A.	A <<uses>> B A <<extends>> B
System boundary	A box surrounding the use cases to separate them from actors.	

Use Case Diagram Example

User

Searches for a topic

Views yielded articles highlighted in amber and red

Creates an account

Gets a balanced breakdown of articles

Gets error due to articles not being found

Requests topic summary

Gets concise summary of for/against on topic

<<uses>>

<<uses>>

<<extends>>

<<extends>>

<<uses>>

Tips for Use Case Diagrams:
- Actors do not need to be directly linked to each use case with a line.
- Arrows between use cases indicate dependencies not sequences.
- <<Extends>> is usually used for error-related and option-related use cases.

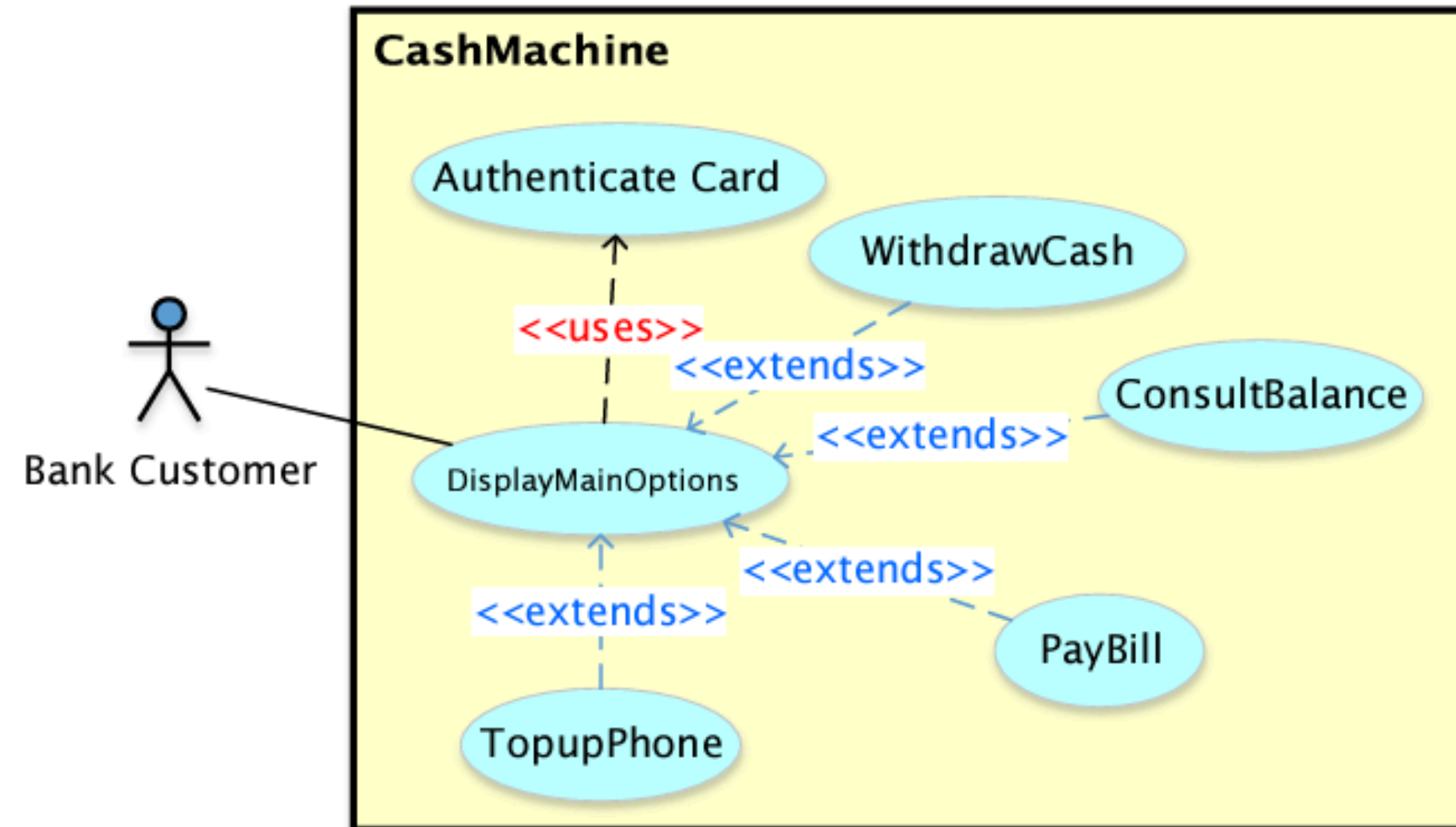# Documentation - Use Case Specification

Use Case Specification Template

Name	
Purpose	
Prerequisites	
Narrative	
Outcome	
Alternative Narrative	
Alternative Narrative Outcome	

Tips for Use Case Specification:
- A specification should describe only one use case not the whole system.
- The narrative should match the use case diagram uses/extends links.

Use Case Specification Example

Name	Gets balanced breakdown of articles
Purpose	User gets a clear, balanced breakdown of articles providing 'for' and 'against' perspectives on any news topic
Prerequisites	"Searches for a topic" use case completed.
Narrative	1.The system fetches and displays a list of articles related to the selected topic. 2. The system categorizes and presents a clear, balanced breakdown of articles, distinguishing between 'for' and 'against' perspectives on the topic. 3. The system highlights articles using the "Views yielded articles highlighted in amber and red" use case.
Outcome	User views articles representing both sides of the argument for a balanced understanding of the topic.
Alternative Narrative	The system does not find enough articles for one perspective of the topic.
Alternative Narrative Outcome	The system displays an error message instead of presenting articles from a single perspective.

Additional Example - Cash Machine Operations

Additional Example - WithdrawCash UCS

Name	WithdrawCash
Purpose	To withdraw cash from bank accounts using the cash machine.
Prerequisites	Customer is authenticated with use-case 'CardAuthentication'.
Narrative	1. Customer selects the cash withdrawal option 2. Customer says amount to withdraw 3. System confirms validity of withdrawal request; machine dispenses requested amount and receipt
Outcome	1. Machine dispenses requested amount and receipt. 2. System updates the account's balance.
Alternative Narrative	Customer cancels cash withdrawal before confirming amount.
Alternative Narrative Outcome	System indicates that the cash withdrawal operation is cancelled.