**What is Use Case?**

**Abbreviations and terms**

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| **Term** | **Description** |
| **Actor** | Human or System Entity participating in a use-case |
| **Goal** | Use-case summary describing the desired outcome |
| **HMI** | Human-machine Interface |
| **HMI Team** | Team developing in-vehicle HMI |
| **OC Team** | Operational Concept team |
| **SA Team** | System Architecture team |
| **TBD** | to be defined |

**References**

|  |  |  |
| --- | --- | --- |
|  | **File Name** | **Link** |
| **1** | Use-Case Best Practices | <https://www.cybermedian.com/the-nut-and-bolts-of-use-case-writing-best-practices-and-common-mistakes/> |
| **2** | How to Write Good Use Case Names - 7 tips | <https://tynerblain.com/blog/2007/01/22/how-to-write-good-use-case-names/> |
| **3** | Alistair Cockburn. Writing Effective Use Cases | <https://www-public.imtbs-tsp.eu/~gibson/Teaching/Teaching-ReadingMaterial/Cockburn00.pdf> |
| **4** | OC UC. Lessons Learnt | <https://evkama.sharepoint.com/:p:/r/sites/KamaEngineeringTeam/_layouts/15/Doc.aspx?sourcedoc=%7B86457B1A-FAD6-441F-B777-3ABA7F957A29%7D&file=OC%20Lessons%20Learnt.pptx&action=edit&mobileredirect=true> |
| **5** | Use Cases in Theory and Practice | [Use Cases in Theory and Practice. Alistair Cockburn.pdf](https://evkama.sharepoint.com/:b:/r/sites/KamaEngineeringTeam/Shared%20Documents/System%20Architecture/OC%20decomposition/Use%20Cases%20in%20Theory%20and%20Practice.%20Alistair%20Cockburn.pdf?csf=1&web=1&e=3Z5AVi) |

**UC Template**

All use-cases shall follow the template

* Bold text: section title, should not be changed
* Text in the angle brackets, template text, to be changed

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| **Use-Case Title *(Mandatory)*:** "<Title>"  **Goal *(Maturity A, mandatory)*:** <goal definition>  **Context *(Maturity A, optional)***: <execution environment>  **Scope *(Maturity A, optional)***: <design boundaries>  **Actors *(Maturity A, mandatory)*:** \* Human *(Mandatory)*   \* <Human Actor 1> \* System *(Optional)*   \* <System Actor 1>  **Preconditions *(Maturity B, mandatory)*:** 1. <Precondition 1  **Triggers *(Maturity B, mandatory)*:** 1. <Trigger 1>  **Main Scenario *(Maturity C, mandatory)*:** 1. <Action 1>  **Post-conditions *(Maturity B, optional)*:** 1. <Post-condition 1>  **Alternative Scenarios *(Maturity C, optional)*:** 1. <Branch 1>  **Exceptions *(Maturity C, optional)*:** 1. <Exception 1>  **Requirements *(Maturity B, optional)*:** \* <Requirement 1> |

**Mandatory sections**

* Mandatory section shall have meaningful section content
* Mandatory section shall not have *N/A* text
* Mandatory section shall

**Optional sections**

* List of the optional sections
* Each optional section shall be marked with string *(optional)*
* Each empty optional section shall be filled with *N/A*

**UC Maturity**

* **Level A**: *Title, Goal,* *Actors* are provided and mandatory, *Context*, *Scope* are optional
* **Level B**: *Title, Goal*, *Actors*, *Preconditions*, *Triggers* are provided and mandatory, *Context*, *Scope*, *Post-conditions* and *Requirements* are optional
* **Level C**: *Title, Goal*, *Actors*, *Preconditions*, *Triggers, Main Scenario* are provided and mandatory, *Context*, *Scope*, *Post-conditions,* *Requirements, Alternative Scenarios and Exceptions* are optional

**Actors**

Human Actor is a non-exclusive role of a human participant.

* Driver
* Fleet Manager
* Owner
* Passenger
* Pedestrian
* User
* Custom role

**System**

System Actors are the in-vehicle systems reflecting high-level operational abstraction.

**In Vehicle**

* ADAS
* AVAS
* Anti-theft System
* Braking System
* Drivetrain System
* Exterior Light System
* HUD
* Interior Light System
* Instrument Cluster
* Passive Safety System
* Wash and Wipe System

**External**

* Cloud (general)
* Mobile App
* Widget

**UC Requirements**

* is based on the Best Practices articles, see ref. 1, 2 and 3;
* follows the Template structure above;
* Applicable to the Description field of the use-case;
* Each chapter is applicable to the corresponding chapter in the Description.

**Use-Case Title (Mandatory)**

* Name is a string of <**XXX**> <**YYY**> <**ZZZ**> where
  + **XXX** - verb infinitive
  + **YYY** - descriptive noun
  + **ZZZ** - optional predicate specifying use-case purpose

*Examples*

* Calculate Speed
* Calculate Vehicle Speed
* Calculate Vehicle Speed from the road wheels
* Calculate Vehicle Speed from braking system or motors

**Goal (Maturity A, mandatory)**

Goal is a free text, describing the author's point of view on the use-case implementation

* what outcome is anticipated
* which actor does the job

*Is the source for the requirements, requirements must not confront the goal*

**Context (Maturity A, optional)**

Context is a free text, describing the context where the use-case is modelled

* time and place boundaries
* environment conditions
* ownership conditions

*No information from this chapter can be considered as the requirements*

**Scope (Maturity A, mandatory)**

Scope is a free text, describing the modelling boundaries for the use-case.

**Actors (Maturity A, mandatory)**

* Actors shall list every use-case participant
* No orphan Actors are allowed

**Human (Mandatory)**

* Human actors represent distinct roles participating in a scenario
* Business unit roles participating in scenario

**System (Optional)**

* System Actors represent the In-Vehicle and External systems performing the actions
* When it is not possible to identify the

**Preconditions (Maturity B, mandatory)**

Preconditions is a semi-structured list describing the Actor states allowing use-case execution

* The Precondition must form the Boolean statement
* All Preconditions shall be TRUE to allow use-case execution
* The Precondition may include the Boolean logic
  + AND operand - both left and right parts are true
  + OR operand - any left or right part is true
  + NOT operand - next right part is negated
  + brackets - combine inner conditions and operands into a single boolean value

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| * User is Owner or Driver * Vehicle is (standstill and Driver presses braking pedal) or Gearbox in P position |

**Triggers (Maturity B, mandatory)**

Triggers represent the events expected to happen to start the use-case execution

* The Trigger us run by the Actor
* The Triggers must form the Boolean statement
* Any of the Triggers shall be TRUE to allow use-case execution
* The Triggers may include the Boolean logic
  + AND operand - both left and right parts are true
  + OR operand - any left or right part is true
  + NOT operand - next right part is negated
  + brackets - combine inner conditions and operands into a single boolean value

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| * Gearbox position changed to P or R * Vehicle speed is above 3kph |

**Main scenario (Maturity C, mandatory)**

Describes the sunny-day case with the most optimistic execution path

* Each step shall describe one of
  + Human Actor
    - provides information​
    - receives information
    - makes a choice​
  + System Actor
    - provides information​
    - asks for information​
    - does some work​
* The Main Scenario shall have from 4 to 10 steps
* Each step shall represent the finished action

**Post-conditions (Maturity B, optional)**

Post-condition is a semi-structured text of the expectations to be fulfilled on the Use-case end

* The Post-condition must form the Boolean statement
* All Post-conditions shall be TRUE to allow use-case execution
* The precondition may include the Boolean logic
  + AND operand - both left and right parts are true
  + OR operand - any left or right part is true
  + NOT operand - next right part is negated
  + brackets - combine inner conditions and operands into a single boolean value

References

* Main Scenario must match the Post-conditions on finish
* Alternative Scenarios must match  the Post-conditions on finish
* Exceptions may not match the Post-Conditions

**Alternative Scenarios (Maturity C, optional)**

The Alternative Scenario extends the Main Scenario rules and

* Each entry must refer to a Main Scenario or other Alternative Scenario branch
* Each entry must describe the logical branch alternative to the main scenario
* Each entry must satisfy the Post-conditions

**Exceptions (Maturity C, optional)**

The Exceptions describe the known cases leading to non-satisfactory Post-conditions.

* Each entry must refer to a single Main Scenario or Alternative Scenario
* Each entry must include at least one Actor
* Each entry must specify the alternative Post-conditions

**Requirements  (Maturity B, optional)**

The requirements represent the non-functional requirements considered by the Main Scenario, Alternative Scenarios, Exceptions.

* No orphaned requirements are allowed