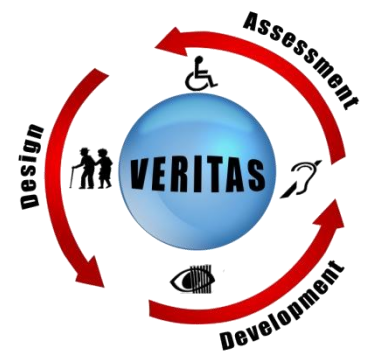




VERITAS project

FP7 247765

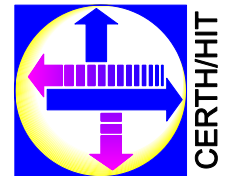


VERITAS Use Cases



Eleni Chalkia

CERTH/HIT



USE CASES INTRODUCTION

○ **Objective:**

- To identify the Use Cases with reference to all the different applications (ICT, non ICT), environments and contexts, including:
 - Automotive
 - Smart living spaces
 - Workplaces
 - Infotainment
 - Healthcare

○ **Definition:**

- A Use Case is a collection of possible sequences of interactions (scenarios) between the system under discussion and its users, relating to a particular goal.

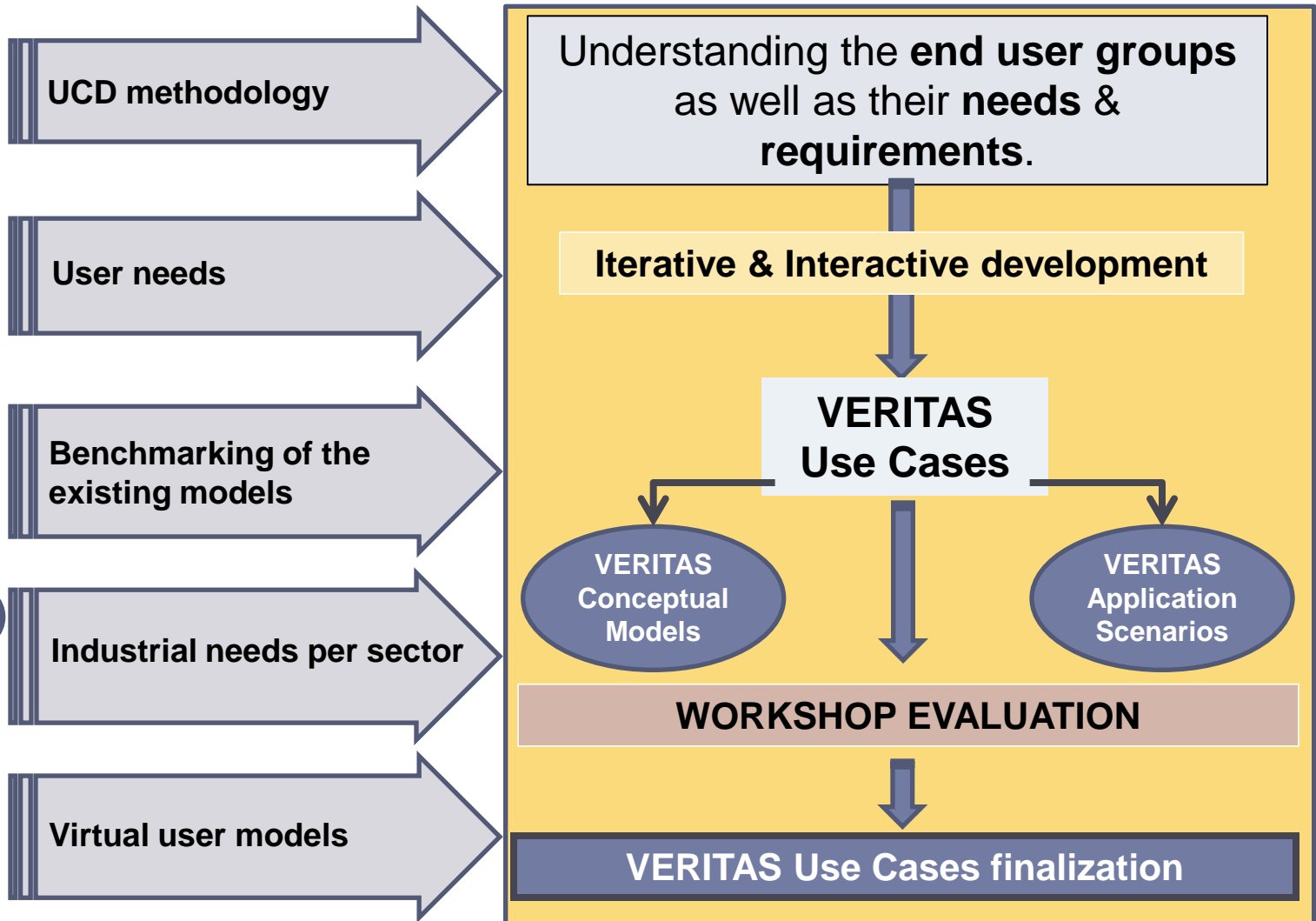


USE CASES APPROACH

- Aim:
 - To simply define what happens when actors interact with the system.
- Usage:
 - To identify, clarify, and organize the system under development as a requirements-gathering tool.
- Content
 - made up of a set of possible sequences of interactions between systems and users in a particular environment and related to a particular goal.

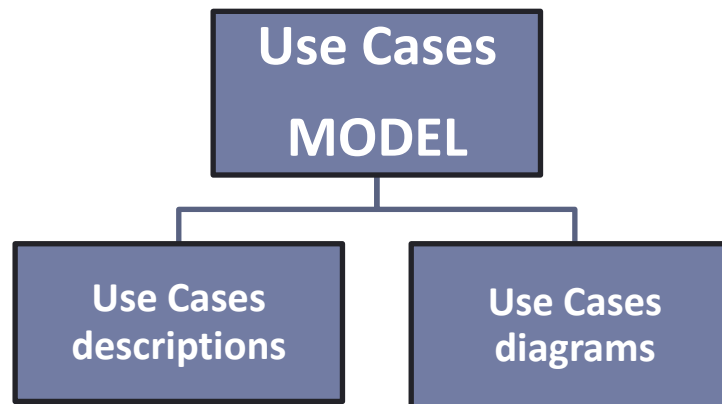


USE CASES METHODOLOGY



USE CASES MODEL

- The result of applying this methodology was an **Use Cases Model**, i.e., a structure to present the variety of scenarios, in a systematic manner. It is comprised of two formats:
 - **Use Case description:** the narrative format, expressed at the level of the users' intentions.
 - **Use Case diagram:** the drawing format (with shapes to represent elements like actors, use cases, etc.) which pretend to illustrate each flow of events.



TARGET GROUPS

○ End Users

- Designers/Developers
 - Automotive
 - Smart living spaces
 - Workplaces
 - eHealth
 - Infotainment

○ Beneficiaries

- People with disabilities
 - Blind and low-vision
 - Motor impairments
 - Cognitive
 - Hearing
 - Speech
- Elderly
 - Young' Elderly: ages 55-64
 - Elderly: ages 65-74
 - Old' Elderly: ages 75 and older



USE CASES CATEGORIES

- To help dealing with the expected large number of VERITAS Use Cases was decided to use a **clustering** technique to separate UC by subject area.
 - The main categories defined were:
 - Use Framework
 - Automotive sector
 - Smart living places
 - Workspaces
 - Infotainment
 - Health Care



USE CASES CLUSTERING

- **Directed to 2 main Groups**

- **Developers**

- Desktop simulation



- Immersive simulation



- **Beneficiaries**

- Real case assessment



USE CASES OVERVIEW

Category 1: Use Framework
UC 1.1: Generation of virtual test sample
UC 1.2.a: Virtual design analysis desktop simulation
UC 1.2.b: Virtual design analysis immersive simulation

Category 2.a: Automotive desktop simulation.	Category 2.b: Automotive immersive simulation
UC 2.1.a: Car interior accessibility desktop simulation.	UC 2.1.b: Car interior immersive simulation.
UC 2.2.a: Motorcycle handling accessibility desktop simulation.	UC 2.2.b: Motorcycle handling immersive simulation..
UC 2.3.a: ADAS/IVIS functionalities desktop simulation.	UC 2.3.b: ADAS/IVIS functionalities immersive simulation.
UC 2.4.a: ARAS/OBIS functionalities desktop simulation.	UC 2.4.b: ARAS/OBIS functionalities immersive simulation.

Category 6.a: Health Care	Category 6.b: Health Care
UC 6.1.a: Remote Patient Monitoring solutions desktop simulation.	UC 6.1.b: Remote Patient Monitoring solutions immersive simulation.
UC 6.2.a: Mobile device for older user's interaction with Personal Health solutions desktop simulation.	UC 6.2.b: Mobile device for older user's interaction with Personal Health solutions immersive simulation.
UC 6.3.a: Medical education and health coach application design.	UC 6.3.b: Medical education and health coach application immersive simulation.

Category 3.a: Smart living places design	Category 3.b: Smart living places simulation
UC 3.1.a: Interior Design desktop simulation.	UC 3.1.b: Interior Design immersive simulation. IN
UC 3.2.a: Domotics desktop simulation.	UC 3.2.b: Domotics immersive simulation.

Category 4.a: Workspaces	Category 4.b: Workspaces
UC 4.1.a: Workplace design accessibility desktop simulation.	UC 4.1.b: Workplace design immersive simulation.
UC 4.2.a: Collaborative tools accessibility desktop simulation.	UC 4.2.b: Collaborative tools immersive simulation.

Category 5.a: Infotainment	Category 5.b: Infotainment
UC 5.1.a: Accessible metaservers desktop simulation.	UC 5.1.b: Accessible metaservers immersive simulation.
UC 5.2.a: Collaborative games for older people desktop simulation.	UC 5.2.b: Collaborative games for older people immersive simulation.



USE CASES DESCRIPTIONS

USE FRAMEWORK

(1/3)

- UC 1.1: Generation of virtual test sample
 - *Scenario 1.1.1: Definition of physical dimensions*
 - The designer specifies the **body dimensions** as stature, sitting height and corpulence of each virtual user of the test sample. The dimensions are given with respect to **gender, age, year** and **nationality**.
 - *Scenario 1.1.2: Definition of impairments*
 - the designer specifies the **impairment classes** (physical, cognitive and psychological), **types** and the corresponding **parameters** for each virtual user of the test sample
 - ❖ **System input → Gender, age group, year and nationality, body dimension, impairment class, type, parameters.**
 - ❖ **System output → Virtual User Model**



USE CASES DESCRIPTIONS

USE FRAMEWORK

(2/3)

- UC 1.2.a: Virtual design analysis desktop simulation
 - *Scenario 1: Assessment of design variant*
 - The designer
 - loads a geometrical design environment from an external system-application
 - selects a task from the task model repository
 - specifies the corresponding task objects in the design environment.
- UC 1.2.b: Virtual design analysis immersive simulation
 - *Scenario 1: Assessment of design variant*
 - The designer
 - loads a geometrical design environment from an external system-application
 - defines the interactive
 - defines interaction tools will be used



USE CASES DESCRIPTIONS

USE FRAMEWORK

(2/3)

- ❖ **System input** → Geometrical design environment, interactive objects, interaction tools.
- ❖ **System output** → Virtual Environment



USE CASES DESCRIPTIONS

AUTOMOTIVE

(1/7)

○ **Category 2.a/b: Automotive desktop/immersive simulation**

- **UC 2.1.a/b:** Car interior accessibility desktop/immersive simulation.
 - Scenario 1: Central rear mirror tuning
 - The designer wants to assess if the design of the car allows the driver to personalize the orientation of the central rear view mirror.
 - For a typical beneficiary.
 - For a beneficiary with upper limb impairment.
 - Scenario 2: Lateral mirror tuning
 - The developer wants to assess if the design of the car allows driver to personalize the orientation of lateral mirrors.
 - For a typical beneficiary.
 - For a beneficiary with upper limb impairments.



USE CASES DESCRIPTIONS

AUTOMOTIVE

(2/7)

○ **Category 2.a/b: Automotive desktop/immersive simulation**

- **UC 2.1.a/b: Car interior accessibility desktop/immersive simulation.**
 - Scenario 3: Hand brake activation/deactivation
 - The designer wants to assess if the design of the car allows the driver to engage or disengage the hand brake.
 - For a beneficiary who is a male, tall and young.
 - For a female, young elderly with low height.
 - Scenario 4: Gear changing
 - The developer wants to assess if the design of the car allows driver to personalize the orientation of lateral mirrors.
 - For a typical beneficiary.
 - For a beneficiary with upper limb impairments.



USE CASES DESCRIPTIONS

AUTOMOTIVE

(3/7)

○ **Category 2.a/b: Automotive desktop/immersive simulation**

- **UC 2.2.a/b:** Motorcycle handling accessibility desktop/immersive simulation.
 - Scenario 1: Riding position.
 - The designer wants to assess if the rider is able to take an adequate position on the vehicle.
 - For a typical beneficiary.
 - For a beneficiary with upper limb impairment.
 - Scenario 2: Usage on bumpy roads (comfort).
 - The developer wants to assess the comfort of the vehicle on bumpy roads.
 - For a typical beneficiary.
 - For a young elderly with slight motor problems.



USE CASES DESCRIPTIONS

AUTOMOTIVE

(4/7)

- **Category 2.a/b: Automotive desktop/immersive simulation**

- **UC 2.2.a/b:** Motorcycle handling accessibility desktop/immersive simulation.
 - Scenario 3: Central stand.
 - The designer wants to assess if the rider is able to place the vehicle on its center stand.
 - For a typical beneficiary.
 - For a young elderly with week body structure.



USE CASES DESCRIPTIONS

AUTOMOTIVE

(5/7)

○ **Category 2.a/b: Automotive desktop/immersive simulation**

- **UC 2.3.a/b: ADAS/IVIS functionalities desktop/immersive simulation.**
 - Scenario 1: On-board navigation system programming
 - The designer wants to assess if the navigation display is reachable.
 - For a typical beneficiary.
 - For a female with low height and (i.e.. Chinese woman)
 - Scenario 2: AUDIO system programming and tuning
 - The developer wants to assess if the audio system is accessible.
 - For a typical beneficiary.
 - For a beneficiary with slight hearing impairment.



USE CASES DESCRIPTIONS

AUTOMOTIVE

(6/7)

○ **Category 2.a/b: Automotive desktop/immersive simulation**

- **UC 2.4.a/b: ARAS/OBIS functionalities desktop/immersive simulation.**
 - Scenario 1: Collision Avoidance system (CAS)
 - The designer wants to assess the accessibility of the HMI of the CAS.
 - For a typical beneficiary.
 - For a beneficiary with colour blindness.
 - Scenario 2: Navigation
 - The developer wants to assess if the navigation system is in the field of vision of the rider.
 - For a typical beneficiary.
 - For a beneficiary with tunnel vision.



USE CASES DESCRIPTIONS

AUTOMOTIVE

(7/7)

- **Category 2.a: Automotive desktop simulation**
 - ❖ **System input → Model, Task, Environment, Tools.**
 - ❖ System output → Possible accessibility issues adapted to the virtual environment

- **Category 2.b: Automotive immersive simulation**
 - ❖ **System input → Model, Task, Environment, Tools.**
 - ❖ System output → Difficulties for the developer to execute the task



USE CASES DESCRIPTIONS

SMART LIVING SPACES

(1/3)

- **Category 3.a/b: Smart living places desktop/immersive simulation**

- **UC 3.1.a/b:** Interior Design desktop/immersive simulation.
 - Scenario 1: In-building navigation accessibility
 - The designer wants to assess if the interior design of a building is accessible for navigation (i.e. stairs-steps height, inclination of ramps, doors width, etc.)
 - For a typical beneficiary.
 - For a beneficiary with lower limb impairments.
 - For a tetraplegic.



USE CASES DESCRIPTIONS

SMART LIVING SPACES

(2/3)

- **Category 3.a/b: Smart living places desktop/immersive simulation**

- **UC 3.2.a/b: Domotics desktop/immersive simulation.**
 - Scenario 1: In-building navigation accessibility
 - The designer wants to assess if the user-interface for remotely monitoring and controlling of appliances.
 - For a typical beneficiary.
 - For an elderly with low vision.
 - Scenario 2: Appliances accessibility
 - The designer wants to assess if a kitchen appliance is accessible.
 - For a typical beneficiary.
 - For an elderly with cognitive impairments.
 - For a beneficiary with upper limb impairments.



USE CASES DESCRIPTIONS

SMART LIVING SPACES

(3/3)

- **Category 3.a: Smart living places desktop simulation**
 - ❖ **System input → Model, Task, Environment, Tools.**
 - ❖ **System output → Possible accessibility issues adapted to the virtual environment Workspaces**
- **Category 3.b: Smart living places immersive simulation**
 - ❖ **System input → Model, Task, Environment, Tools.**
 - ❖ **System output → Difficulties for the developer to execute the task**



USE CASES DESCRIPTIONS

WORKSPACES

(1/4)

○ **Category 4.a/b: Workspaces desktop/immersive simulation**

- **UC 4.1.a/b:** Workspace design accessibility desktop/immersive simulation.
 - Scenario 1: In office navigation accessibility
 - The designer wants to assesses the accessibility of the pathway from the entrance to the room.
 - For a typical beneficiary.
 - For a beneficiary with lower limb impairments.
 - For a tetraplegic.
 - Scenario 2: Printer and closet accessibility
 - The designer wants to assesses the accessibility of the printer location and closets
 - For a typical beneficiary.
 - For a beneficiary with lower limb impairments.
 - For a beneficiary with upper limb impairments.



USE CASES DESCRIPTIONS

WORKSPACES

(2/4)

- **Category 4.a/b: Workspaces desktop/immersive simulation**

- **UC 4.1.a/b:** Workspace design accessibility desktop/immersive simulation.
 - Scenario 3: E-mail software accessibility.
 - The designer wants to assesses the accessibility of the email software.
 - For a typical beneficiary.
 - For a beneficiary with colour blindness.
 - For a beneficiary with cognitive impairments.



USE CASES DESCRIPTIONS

WORKSPACES

(3/4)

○ **Category 4.a/b: Workspaces desktop/immersive simulation**

- **UC 4.2.a/b:** Collaborative tools accessibility desktop/immersive simulation.
 - Scenario 1: Accessibility of distance collaborative working tool.
 - The designer wants to assesses the accessibility of the HMI of a collaborative working tool.
 - For a typical beneficiary.
 - For a beneficiary with cognitive impairments.
 - For a beneficiary with visual impairments.
 - Scenario 2: Accessibility of teleconferencing tool
 - The designer wants to assesses the accessibility of teleconferencing tool.
 - For a typical beneficiary.
 - For a beneficiary with hearing impairments.



USE CASES DESCRIPTIONS

WORKSPACES

(4/4)

- **Category 4.a: Workspaces desktop simulation**
 - ❖ **System input → Model, Task, Environment, Tools.**
 - ❖ System output → Possible accessibility issues adapted to the virtual environment

- **Category 4.b: Workspaces immersive simulation**

- ❖ **System input → Model, Task, Environment, Tools.**
- ❖ System output → Difficulties for the developer to execute the task



○ Category 5.a/b: Infotainment desktop/immersive simulation

- **UC 5.1.a/b:** Accessible metaverses desktop/immersive simulation.
 - Scenario 1: UI Design
 - The designer wants to assesses the accessibility of the 2D UI Design.
 - For a typical beneficiary.
 - For a beneficiary with visual impairments.
 - For a beneficiary with cognitive impairments.
 - Scenario 2: Accessibility of 3D UI Elements
 - The designer wants to assesses the accessibility of 3D UI Elements
 - For a typical beneficiary.
 - For a beneficiary with visual impairments.
 - For a beneficiary with cognitive impairments.



○ Category 5.a/b: Infotainment desktop/immersive simulation

- **UC 5.1.a/b:** Accessible metaverses desktop/immersive simulation.
 - Scenario 3: 3D Metaverse Environment Navigation
 - The designer wants to assesses the accessibility of the 3D metaverse environment navigation.
 - For a typical beneficiary.
 - For a beneficiary with visual impairments.
 - For a beneficiary with cognitive impairments.
 - Scenario 4: Inter-user Interaction
 - The designer wants to assesses the accessibility of the Inter-user Interaction.
 - For a typical beneficiary.
 - For a beneficiary with visual impairments.
 - For a beneficiary with cognitive impairments.



○ **Category 5.a/b: Infotainment desktop/immersive simulation**

- **UC 5.1.a/b: Accessible metaverses desktop/immersive simulation.**
 - Scenario 1: UI Design
 - The designer wants to assesses the accessibility of the 2D UI Design.
 - For a typical beneficiary.
 - For a beneficiary with visual impairments.
 - For a beneficiary with cognitive impairments.
 - Scenario 2: Accessibility of 3D UI Elements
 - The designer wants to assesses the accessibility of 3D UI Elements
 - For a typical beneficiary.
 - For a beneficiary with visual impairments.
 - For a beneficiary with cognitive impairments.



○ Category 5.a/b: Infotainment desktop/immersive simulation

- **UC 5.2.a/b:** Collaborative games desktop/immersive simulation.
 - Scenario 1: Game Controls Accessibility
 - The designer wants to assess the accessibility of game controls accessibility
 - For a typical beneficiary.
 - For a beneficiary with cognitive impairments.
 - Scenario 2: Game Display Settings Accessibility
 - The designer wants to assess the accessibility of the game display settings accessibility.
 - For a typical beneficiary.
 - For a beneficiary with visual impairments.



- **Category 5.a/b: Infotainment desktop/immersive simulation**

- **UC 5.2.a/b:** Collaborative games desktop/immersive simulation.
 - Scenario 3: Multiplayer Mode Accessibility
 - The designer wants to assesses the accessibility of Multiplayer Mode Accessibility
 - For a typical beneficiary.
 - For a beneficiary with visual impairments.
 - For a beneficiary with cognitive impairments.



- **Category 5.a: Infotainment desktop simulation**
 - ❖ **System input → Model, Task, Environment, Tools.**
 - ❖ **System output → Possible accessibility issues adapted to the virtual environment**

- **Category 4.b: Infotainment immersive simulation**
 - ❖ **System input → Model, Task, Environment, Tools.**
 - ❖ **System output → Difficulties for the developer to execute the task**



USE CASES DESCRIPTIONS

HEALTHCARE

(1/6)

○ Category 6.a/b: Healthcare desktop/immersive simulation

- **UC 6.1.a/b:** Remote Patient Monitoring solutions desktop/immersive simulation.
 - Scenario 1: Wearing and removing the body's sensors
 - The designer wants to assesses if the design of the wearable sensors (shape, size, fixing mechanism) allows the elderly to handle them and to fix them in the right position.
 - For a typical beneficiary.
 - For a beneficiary with upper limb impairments.
 - Scenario 2: Set-up of the Remote Monitoring System
 - The designer wants to assesses if the tutorial provided to the user on the screen of his mobile device allows the user to execute the right sequence of operations for the set up of the Remote Monitoring System.
 - For a typical beneficiary.
 - For a beneficiary with cognitive impairments.



USE CASES DESCRIPTIONS

HEALTHCARE

(2/6)

○ Category 6.a/b: Healthcare desktop/immersive simulation

- **UC 6.2.a/b:** Mobile device solution desktop/immersive simulation.
 - Scenario 1: Handling mobile device
 - The designer wants to assesses if the user can grasp the device and if it is able to handle it.
 - For a typical beneficiary.
 - For a beneficiary with upper limb impairments.
 - For a beneficiary with cognitive impairments.
 - Scenario 2: Interaction with the touch screen
 - The designer wants to assesses if the user can interact with the touch screen.
 - For a typical beneficiary.
 - For a beneficiary with upper limb impairments.
 - For a beneficiary with cognitive impairments.



USE CASES DESCRIPTIONS

HEALTHCARE

(3/6)

○ **Category 6.a/b: Healthcare desktop/immersive simulation**

- **UC 6.2.a/b:** Mobile device solution desktop/immersive simulation.
 - Scenario 3: interaction with the voice (input and/or output interface).
 - The designer wants to assesses if the user can interaction with the voice.
 - For a typical beneficiary.
 - For a beneficiary with speech impairments.
 - For a beneficiary with cognitive impairments.



USE CASES DESCRIPTIONS

HEALTHCARE

(4/6)

○ Category 6.a/b: Healthcare desktop/immersive simulation

- **UC 6.3.a/b:** Medical education and health coach desktop/immersive simulation.
 - Scenario 1: Exchanging messages with the doctor
 - The designer wants to assesses if the user is able to exchange messages with his doctor .
 - For a typical beneficiary.
 - For an young elderly.
 - For an old elderly.
 - Scenario 2: Searching for medical news
 - The designer wants to assesses if the user is able to search and read the news.
 - For a typical beneficiary.
 - For an young elderly.
 - For a beneficiary with visual impairments.



USE CASES DESCRIPTIONS

HEALTHCARE

(5/6)

○ **Category 6.a/b: Healthcare desktop/immersive simulation**

- **UC 6.3.a/b:** Medical education and health coach desktop/immersive simulation.
 - Scenario 3: Giving warnings to the user
 - The designer wants to assesses if the warnings given to the user are accessible.
 - For a typical beneficiary.
 - For an young elderly.
 - For a beneficiary with cognitive impairments.



USE CASES DESCRIPTIONS

HEALTHCARE

(6/6)

- **Category 6.a: Healthcare desktop simulation**
 - ❖ **System input → Model, Task, Environment, Tools.**
 - ❖ System output → Possible accessibility issues adapted to the virtual environment

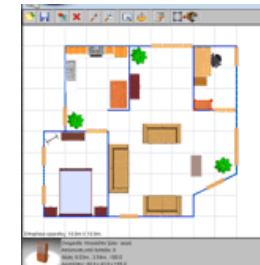
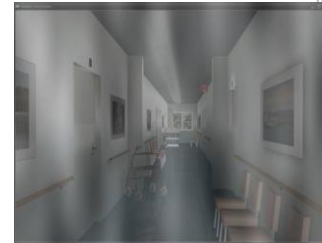
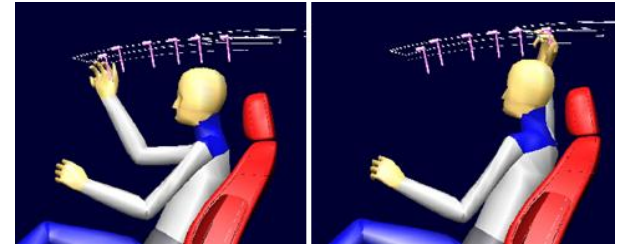
- **Category 6.b: Healthcare immersive simulation**
 - ❖ **System input → Model, Task, Environment, Tools.**
 - ❖ System output → Difficulties for the developer to execute the task



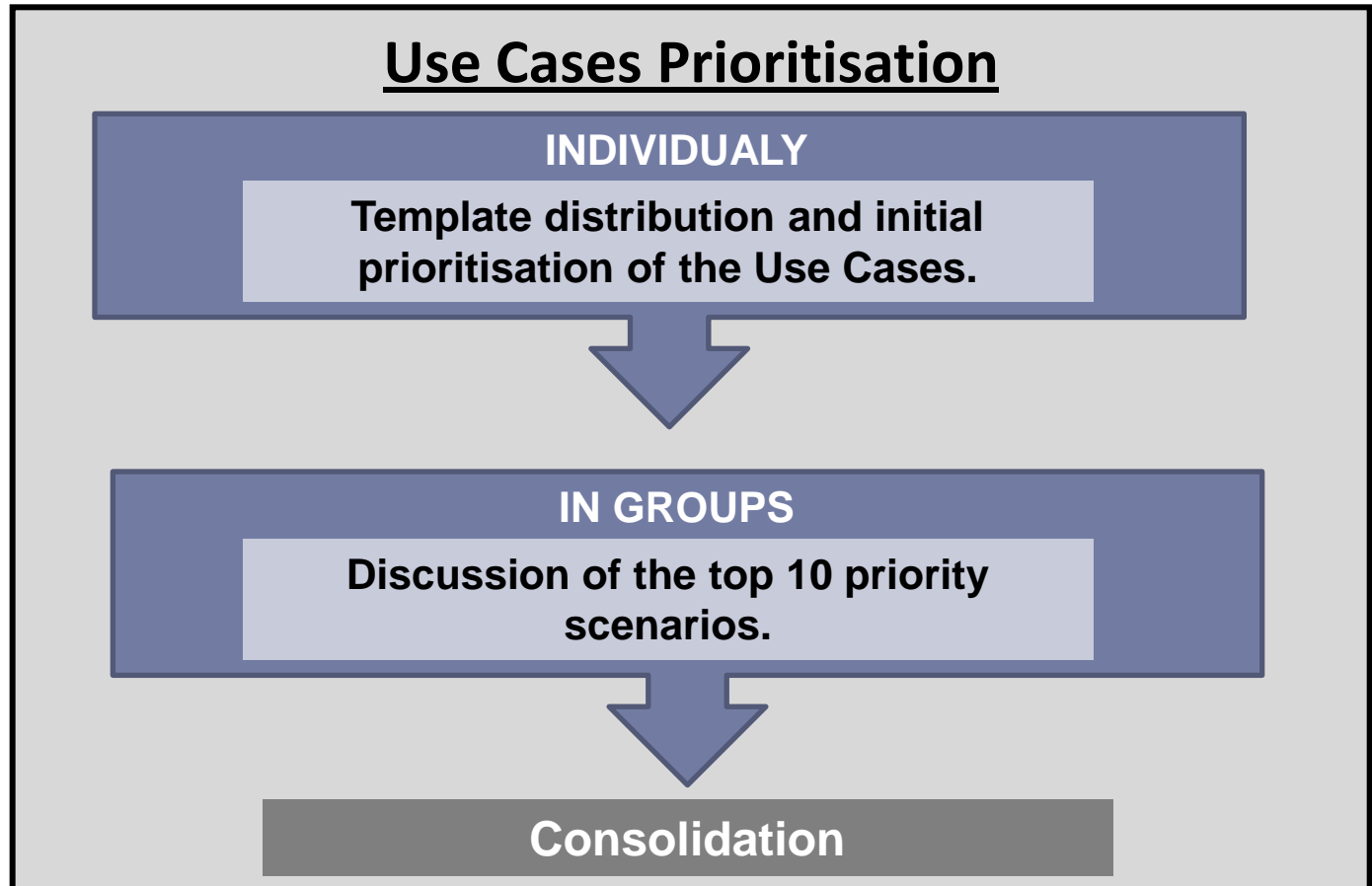
USE CASES TOTAL

○ 29 Use Cases in total

- 3 for the Use Framework
- 8 for the Automotive sector
- 4 for the Smart living spaces
- 4 for the Workspaces
- 4 for the Infotainment
- 6 for the Health Care



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USE CASES PRIORITISATION

(2/2)

○ Example

	Priority (1,2,3)	Reasons pro	Reasons con
<u>Category 2- Automotive desktop simulation</u>			
UC 2.1 Car interior accessibility simulation			
Scenario 1: Central rear mirror tuning			
Scenario 2: Lateral mirror tuning			
Scenario 3: Hand brake activation/deactivation			
Scenario 4: Gear changing			



- TOP priority → 1
- MEDIUM priority → 2
- LOW priority → 3

Rate the Use Cases first in order to have the TOP priority Use Cases
Then prioritise the Scenarios in order to have the TOP priority Scenarios within each Use Case

