

Concept and Architecture of the Application

“VR Application – VR4SKILLS”
Marcin Marczak, Karol Jędrasiak,
Paweł Buchwald
August 2024



Co-funded by
the European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author or authors only and do not necessarily reflect those of the European Union or the Foundation for the Development of the Education System. Neither the European Union nor the entity providing the grant can be held responsible for them

Project Number: 2022-1-PL01-KA220-HED-000089035

Project Title: VR4SKILLS - Comprehensive training framework for leaders of internationalization enhanced by Virtual Reality (VR) in the post-pandemic era.



VR4 Skills



Part 1

Application Concept

VR4
Skills

Introduction

This chapter presents the concept of the application developed for project number 2022-1-PL01-KA220-HED-000089035 under the Cooperation Partnerships program.

The focus of the work is the preparation, delivery, and implementation of the software titled "VR Application – VR4SKILLS" – a training tool with functional, technical, and usability parameters defined in the chapter "Functional Requirements."

Requirements

- | the subject of the order must be brand new.
- | the installation, setup, and testing of the complete subject of the order before the final acceptance is approved.
- | the implementation of the system on the equipment specified
- | the delivery of user manuals in both Polish and English.
- | to conduct training at their own expense, covering the delivered equipment and software in terms of usage and individual functions, concluding with the issuance of a certificate from the software manufacturer, on-site at the Client's location, for a minimum of 10 people, for at least 80 hours or as specified by the Client.

The access to the application and its unlimited use (covering any licensing fees resulting from the terms of use of the specific engine on which the application is built for a period of no less than 2 years, if such a fee is necessary). If there is no need to incur licensing fees, provide a statement on the day of signing the final acceptance protocol stating that no licensing fees are required.

The software should not include 2D interface screens for user communication, unless required by the scenario. The software should be 3D and designed for use with VR goggles.

The display of the world model should be at a 1:1 scale or larger without any data conversion or data loss.

There should be no data conversion or limitations on size, resolution, shape, or performance during rendering; no export or import processes should be required.

A collision detection function in the virtual world must be available in the software and must not depend on third-party software or hardware.

The conduct internal tests of the application before handing it over for testing.

The software should be sound-enabled and include a soundtrack. The devices and technologies used should respect employee rights and safety regulations.



Ensures the proper functioning of the “VR Application – VR4SKILLS”; in the event that the suppliers of the engine on which the application was built or the hardware for operating the application (goggles and controllers) make updates or changes that may lead to improper functioning of the application, the contractor commits to performing updates free of charge for a period of 2 years from the date of signing the final acceptance protocol of the application.

While one user is using the “VR Application – VR4SKILLS,” other meeting participants should be able to follow the user’s actions on the screen. The visualized image on the screen should be consistent without division into VR transformations for the left and right eyes in the VR goggles.

The application should have a measured level of educational excellence confirmed by the GETES Educational Excellence Level Certificate.

All implemented scenarios should be available in English.

Each running scenario should be interruptible using the VR controllers, allowing the user to return to the menu.

License

The software license will be unlimited in terms of the number of installations (Multi Open type) and unlimited in duration (permanent type).

Warranty Assumptions

It requires that:

- I The warranty period be a minimum of 24 months from the date of signing the final acceptance protocol confirming the proper execution of the entire subject of the order. Any interruption in use due to warranty repairs will automatically extend the warranty period by that duration.
- I Warranty service be provided by an authorized service or manufacturer.
- I In the event of a defect or failure occurring must begin addressing the issue within 4 working days from the date of notification and complete the repairs within the following 14 working days. If the repair time exceeds this, the Contractor shall, at the Client’s request, provide a temporary replacement of the ordered item with identical or better technical specifications for the duration of the repair.

- I Provide author support services with a response time not exceeding 48 hours from the time of notification, for a period of 24 months from the date of contract signing.

- I Provide installation service, meaning the software must be installed on the computers specified within no more than 24 hours from the time of notification, or within a timeframe agreed upon, for a period of 24 months from the date of contract signing.

Scope of Implementation

Delivery of the software titled “VR Application – VR4SKILLS” in the VR computer version and its implementation on the PC workstation specified by the Client, connected to compatible Meta Quest 2 goggles.

Transfer of Codes

It is required to provide the source code of the application “VR Application – VR4Skills” to enable its future development. The source code should include comments and be unobfuscated. The transferred code will also include the project file from Unreal Engine 5.4 along with 3D models, sounds, and textures. For the web application, the project from PyCharm will be provided along with the images.

Scope of Work Divided into Stages of Implementation:

Stage	Scope of Work
Stage 1	Concept and Architecture of the Application
Stage 2	Scenario recordings 1
Stage 3	Scenario recordings 2
Stage 4	Scenario recordings 3
Stage 5	Scenario recordings 4
Stage 6	Implementation of the Core Software Layer of the Application
Stage 7	Implementation of the Scenario 1
Stage 8	Implementation of the Scenario 2
Stage 9	Implementation of the Scenario 3
Stage 10	Implementation of the Scenario 4 and 5
Stage 11	Application Testing
Stage 12	Web Version of the Application
Stage 13	Testing of the Web Version of the Application
Final Acceptance	User Manuals, GETES Educational Excellence Level Certificate



Hardware Requirements

Meta Quest 2 goggles connected to a compatible PC workstation according to Meta's specifications. The minimum hardware requirements for operating the Oculus Quest 2 VR set are a processor equal to or better than an Intel i5-4590 or AMD Ryzen 5 1500X, at least 8GB of RAM, Windows 10 operating system, and USB 3.0 support.

Requirements Regarding Refresh Rate

The software should be smoothly rendered at the full refresh rate of the VR goggles, not less than 70 Hz, regardless of the activities performed by the user in the virtual world.

Application Engine

- The engine for the application "VR Application – VR4SKILLS" will be Unreal Engine version 5.4 or newer.
- The engine for the web version of the above application will be Dash, Plotly in Python. The Client will not incur hosting costs for the web application server during the warranty period.

Functional Requirements

This section presents the organized functional requirements of the VR4SKILLS application in VR format:

Division of the application into the following scenes:

- Starting Scene "MENU" implemented as interactive 3D, displayed immediately after launching the application – allowing users to familiarize themselves with the scenarios and select a scenario:
 - Scenario 1 – Door No. 1. If the scenario has been completed according to the information in the device's local memory, a notification will be displayed;
 - Scenario 2 – Door No. 2. If the scenario has been completed according to the information in the device's local memory, a notification will be displayed;
 - Scenario 3 – Door No. 3. If the scenario has been completed according to the information in the device's local memory, a notification will be displayed;
 - Scenario 4 – Door No. 4. If the scenario has been completed according to the information in the device's local memory, a notification will be displayed;
 - Scenario 5 – Door No. 5. If the scenario has been completed according to the information in the device's local memory, a notification will be displayed;

and use the following application options:

- Selection of subtitle language in the videos:
 - English;

- | Polish.

- | Selection of High Contrast Mode:

- | ON;

- | OFF.

This scene also serves as a tutorial that allows users to learn how to interact with the application. The tutorial begins immediately after launching the application, with the option to skip it by interacting with the “skip” option.

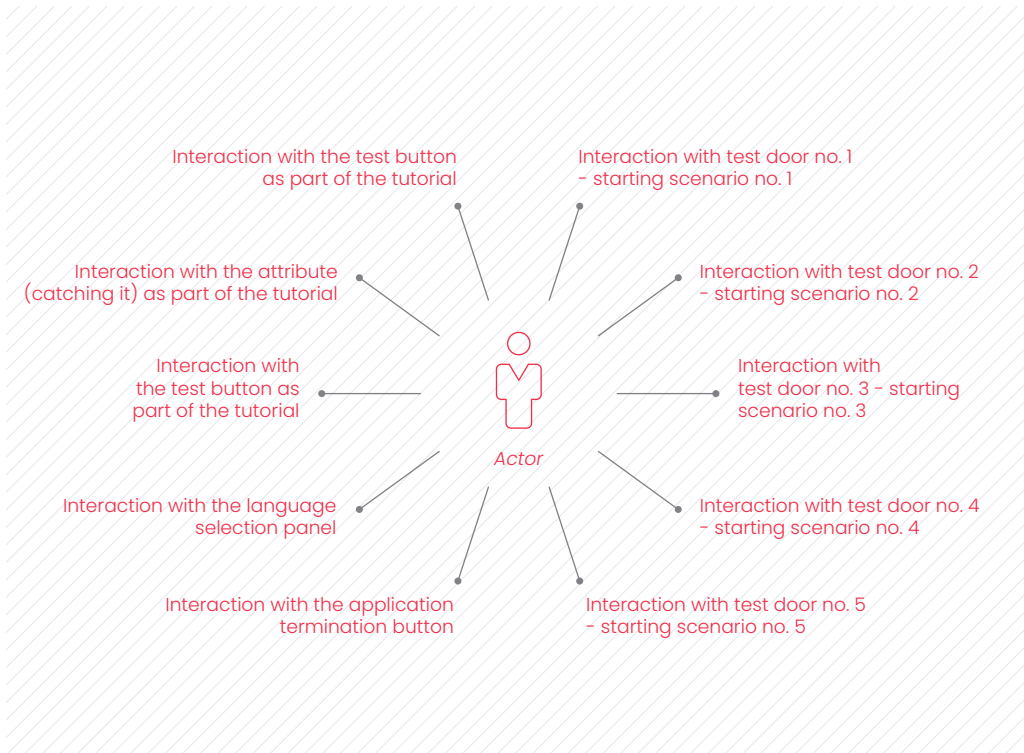
This scene also includes basic information about the VR4SKILLS project.

The menu also includes an option to exit the application, which closes the application when selected.

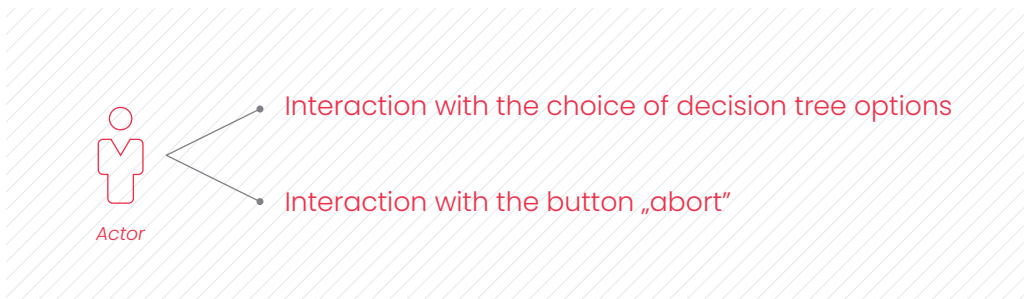
- | Scenario Scene 1 – implemented as a cinematic (360) decision tree according to Scenario 1 in the second part of the document. The scenario can be interrupted and the user can return to the MENU by selecting the “PAUSE” option.
- | Scenario Scene 2 – implemented as a cinematic (360) decision tree according to Scenario 2 in the second part of the document. The scenario can be interrupted and the user can return to the MENU by selecting the “PAUSE” option.
- | Scenario Scene 3 – implemented as a cinematic (360) decision tree according to Scenario 3 in the second part of the document. The scenario can be interrupted and the user can return to the MENU by selecting the “PAUSE” option.
- | Scenario Scene 4 – implemented as a cinematic (360) decision tree according to Scenario 4 in the second part of the document. The scenario can be interrupted and the user can return to the MENU by selecting the “PAUSE” option.
- | Scenario Scene 5 – implemented as an interactive 3D world in which the user can freely move using body movements or a teleportation mechanism. During the execution of Scenario 5 in the second part of the document, the user can interact with active elements of the scenario by pointing to a button and pressing it or touching it and pressing it. The scenario can be interrupted and the user can return to the MENU by selecting the “PAUSE” option.
- | Results Screen Scene – implemented as a static screen with a board presenting a summary of the selected scenario. The content of the board will depend on the scenario and the decisions made during its execution. From the results screen, the user can return to the MENU by selecting the “END” option. Displaying the results screen saves information about the completion of the selected scenario in the device’s local memory.



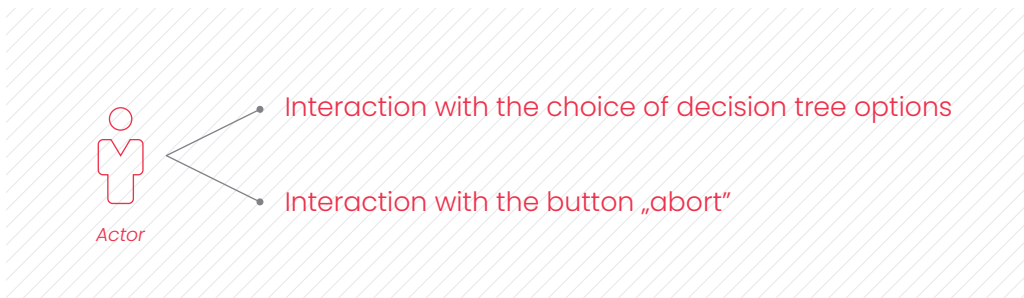
Use Case Diagram of the Menu:



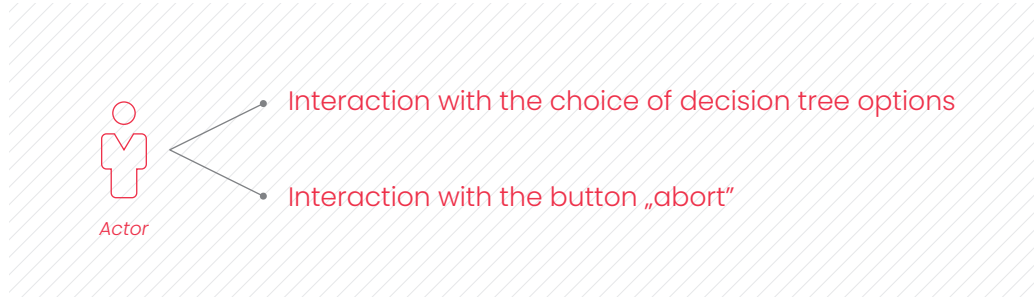
Use case diagram for scenario 1:



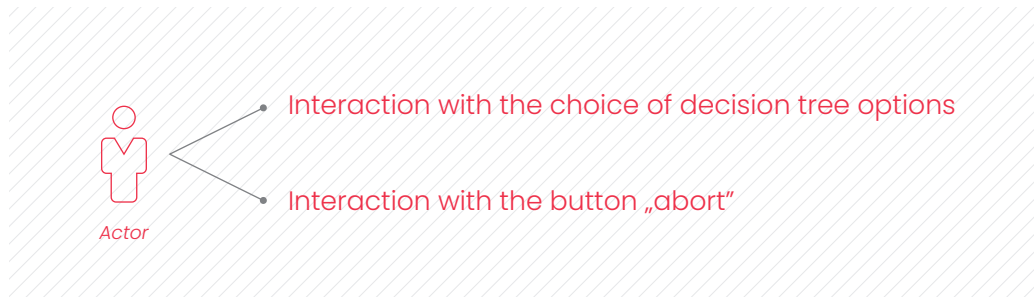
Use case diagram for scenario 2:



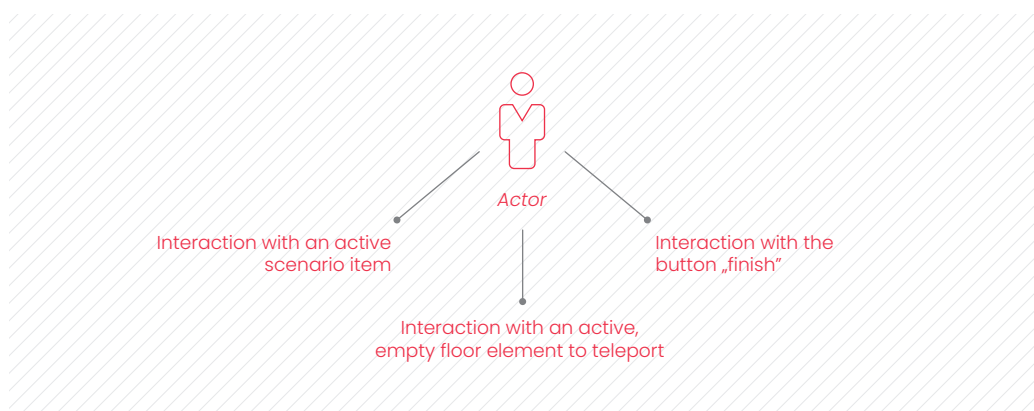
Use case diagram for scenario 3:



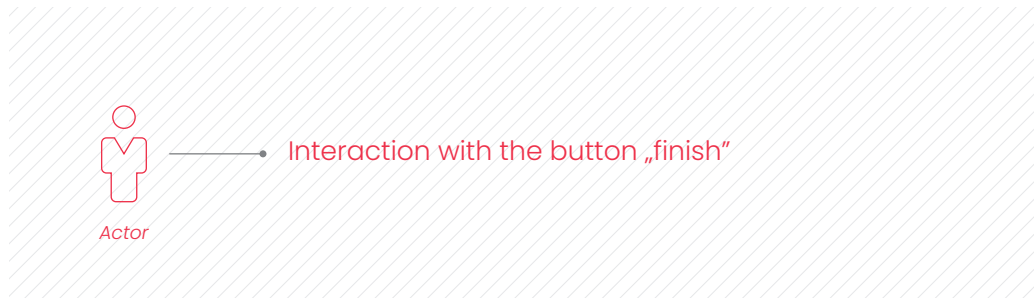
Use case diagram for scenario 4:



Use case diagram for scenario 5:



Use case diagram for the results screen:



This section presents the organized functional requirements of the VR4SKILLS application in web form:

Division of the application into the following screens:

- Startup screen 'MENU' presented in a visual-text format, displayed immediately after launching the application. The screen allows users to familiarize themselves with the scenarios and select a scenario:
 - Scenario 1 – Button number 1. If the scenario has been completed according to the information in the device's local memory, a notification will be displayed;
 - Scenario 2 – Button number 2. If the scenario has been completed according to the information in the device's local memory, a notification will be displayed;
 - Scenario 3 – Button number 3. If the scenario has been completed according to the information in the device's local memory, a notification will be displayed;
 - Scenario 4 – Button number 4. If the scenario has been completed according to the information in the device's local memory, a notification will be displayed;
 - Scenario 5 – Unavailable in the web version.

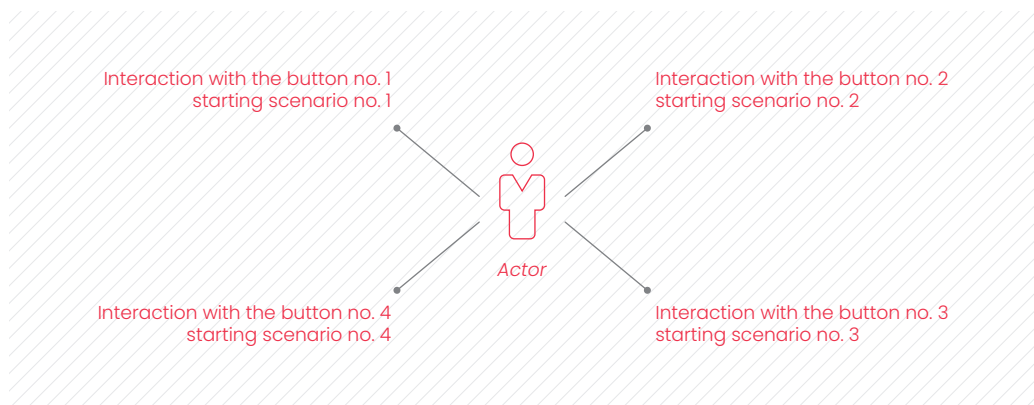
This screen also contains basic information about the VR4SKILLS project.

- Scenario screen number 1 – Presented in the form of a cinematic (classic film) decision tree according to scenario number 1 in the second part of the document. The scenario can be interrupted and returned to the MENU by selecting the 'BREAK' option. Interaction options with the film are displayed below the video. The screen also allows for selecting the subtitle language in the films and enabling high contrast mode.
- Scenario screen number 2 – Presented in the form of a cinematic (classic film) decision tree according to scenario number 2 in the second part of the document. The scenario can be interrupted and returned to the MENU by selecting the 'BREAK' option. Interaction options with the film are displayed below the video. The screen also allows for selecting the subtitle language in the films and enabling high contrast mode.
- Scenario screen number 3 – Presented in the form of a cinematic (classic film) decision tree according to scenario number 3 in the second part of the document. The scenario can be interrupted and returned to the MENU by selecting the 'BREAK' option. Interaction options with the film are displayed below the video. The screen also allows for selecting the subtitle language in the films and enabling high contrast mode.
- Scenario screen number 4 – Presented in the form of a cinematic (classic film) decision tree according to scenario number 4 in the second part of the document. The scenario can be interrupted and returned to the MENU by selecting the 'BREAK' option. Interaction options with the film are displayed below the video. The screen

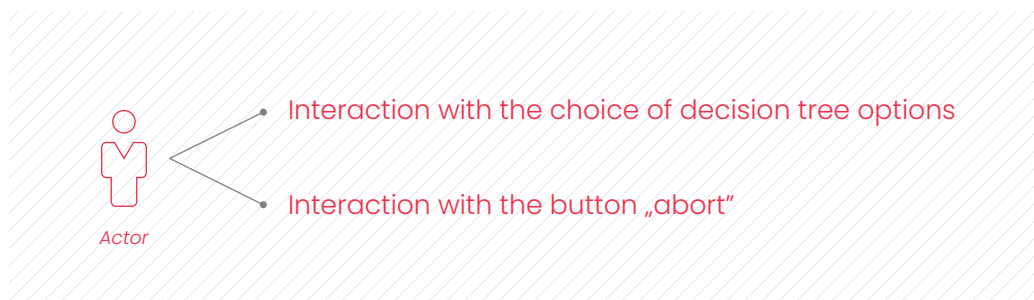
also allows for selecting the subtitle language in the films and enabling high contrast mode.

- | Results screen – Presented in the form of a static screen with a board displaying summary information about the selected scenario. The content of the board will depend on the scenario and the decisions made during its execution. From the results screen, you can return to the MENU by selecting the ‘END’ option. Displaying the results screen saves information about the completion of the selected scenario in the device’s local memory.
- | The VR4SKILLS application records information about each visit to a given screen along with the date of the visit for the purpose of application usage statistics. Data will be stored in a MYSQL Server database.

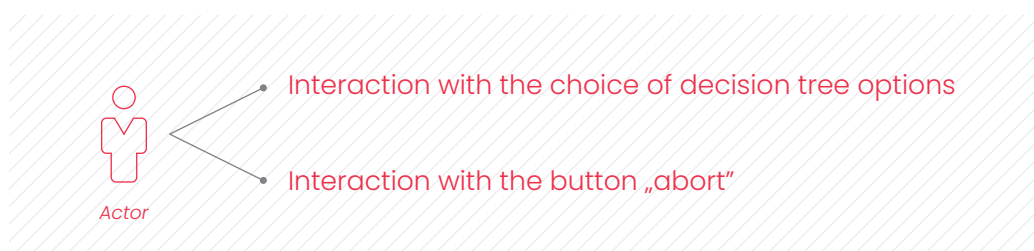
Use case diagrams for the menu in the web version:



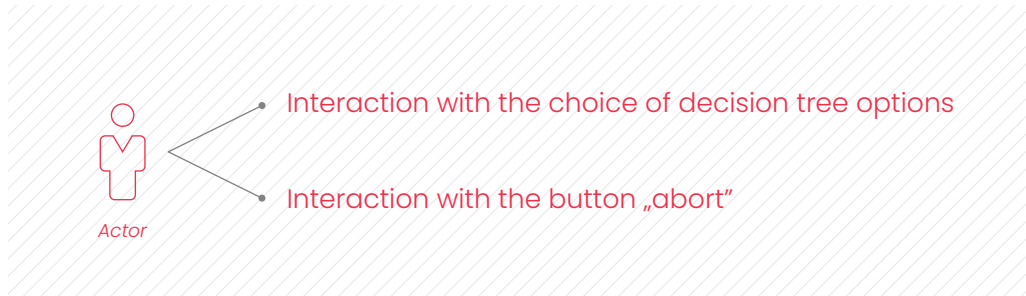
Use case diagrams for scenario 1 in the web version:



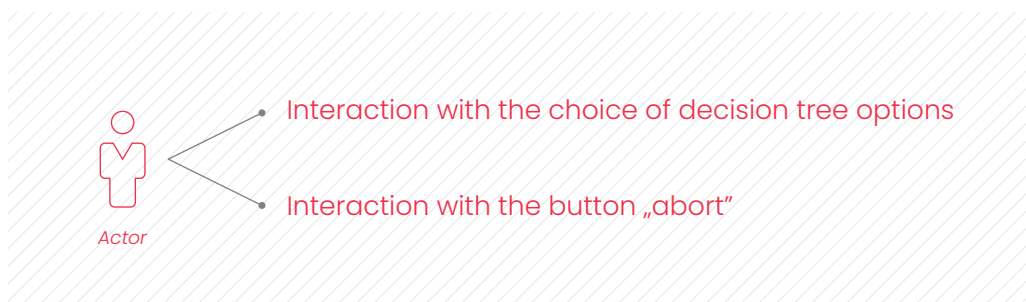
Use case diagrams for scenario 2 in the web version:



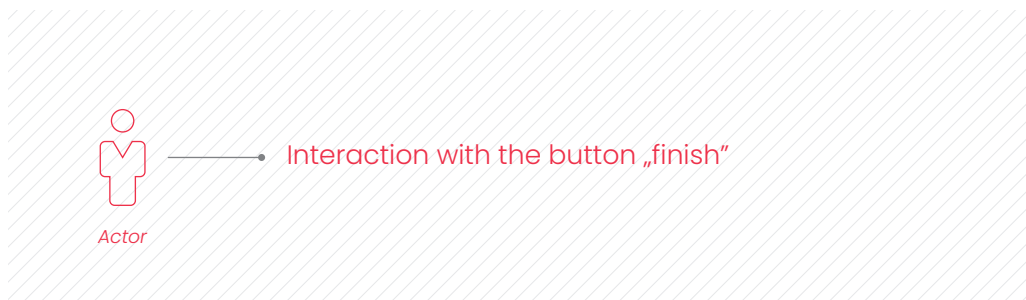
Use case diagrams for scenario 3 in the web version:



Use case diagrams for scenario 4 in the web version:



Use case diagram for the results screen:



Requirements for the protection of personal data

The application has been designed in such a way that it does not require the processing of users' personal data at any stage of its operation. This means that, both in the VR and web versions, there is no collection, processing, or storage of any information that could be considered personal data under applicable data protection regulations. Consequently, the implementation of additional security mechanisms, such as data encryption, user consent management, or other privacy protection techniques, is unnecessary, as the risk associated with privacy breaches is minimized in this case. This approach aligns with the principle of data minimization, which is one of the key pillars of modern data protection and information security practices. Tailoring security measures to the actual scope of processed data not only optimizes technical resources but also minimizes potential risks and burdens associated with excessive security implementations, which are unnecessary in this context.

Cybersecurity requirements

Although the application is interactive, it has been designed in a way that does not require the saving of any data affecting the execution of individual scenarios. The only information saved locally on the user's device is whether a given scenario has been completed. However, it is important to emphasize that this information does not impact the ability to restart or replay the same scenario, ensuring that the user has complete flexibility in using the application.

All content, including texts, images, and videos, is integrally embedded in the structure of the application in both its VR and web versions. This means that there is no possibility of modifying or replacing them during the application's operation, significantly enhancing the security of the content delivered to users. Due to the lack of external data exchange and the absence of a need for real-time content updates, the implementation of additional security mechanisms, such as advanced data protection systems, network traffic monitoring, or data integrity control mechanisms, is unnecessary. The application has been designed with the principle of risk minimization in mind, which means that the current level of security is fully adequate to the range of functions and data processed by the application.





Part II

Application Architecture

VR4
Skills

Introduction

This chapter presents the architecture adopted for the application developed for project number 2022-1-PL01-KA220-HED-000089035 under the Partnership for Cooperation program.

The subject of the work is the preparation, delivery, and implementation of software titled 'VR Application – VR4SKILLS' – a training tool with functional, technical, and user parameters specified in the chapter 'Functional Requirements.'.

Adopted method of visualizing scenario content

Adopted method of visualizing scenario content for the VR version of the application:

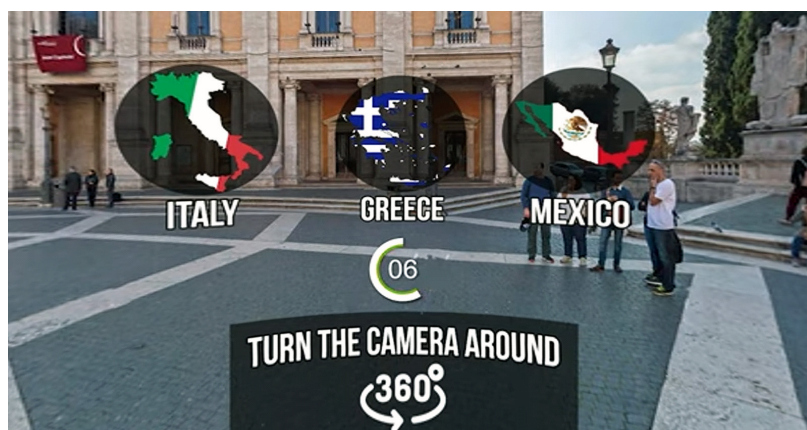
- I Scenario 1 – Recordings during the execution of the scenario in the form of a cinematic decision tree will be displayed as a 360-degree sphere. The user's viewpoint is positioned in the center of the sphere and can rotate around in three degrees of freedom. If the user changes their position, the sphere moves with them, ensuring that regardless of the user's movement, they will always remain at the center of the sphere. Therefore, the recommended way to use the scenario is for the user to stand or sit during its execution. The scenario consists of a cinematic decision tree, so when a decision needs to be made, the film scenario pauses while waiting for the user's choice. At that moment, options for continuing the film appear before the user. After selecting an option, the user continues the scenario according to the chosen branch of the tree. If the final decision is made, the scenario will automatically switch to the results screen, presenting a summary of the scenario execution based on the decisions made.
- I Scenario 2 – Recordings during the execution of the scenario in the form of a cinematic decision tree will be displayed as a 360-degree sphere. The user's viewpoint is positioned in the center of the sphere and can rotate around in three degrees of freedom. If the user changes their position, the sphere moves with them, ensuring that regardless of the user's movement, they will always remain at the center of the sphere. Therefore, the recommended way to use the scenario is for the user to stand or sit during its execution. The scenario consists of a cinematic decision tree, so when a decision needs to be made, the film pauses while waiting for the user's choice. At that moment, options for continuing the film appear before the user. After selecting an option, the user continues the scenario according to the chosen branch of the tree. If the final decision is made, the scenario will automatically switch to the results screen, presenting a summary of the scenario execution based on the decisions made.
- I Scenario 3 – Recordings during the execution of the scenario in the form of a cinematic decision tree will be displayed as a 360-degree sphere. The user's viewpoint is positioned in the center of the sphere and can rotate around in three degrees of freedom. If the user changes their position, the sphere moves with them, ensuring that regardless of the user's movement, they will always remain at the center of



the sphere. Therefore, the recommended way to use the scenario is for the user to stand or sit during its execution. The scenario consists of a cinematic decision tree, so when a decision needs to be made, the film pauses while waiting for the user's choice. At that moment, options for continuing the film appear before the user. After selecting an option, the user continues the scenario according to the chosen branch of the tree. If the final decision is made, the scenario will automatically switch to the results screen, presenting a summary of the scenario execution based on the decisions made.

- I** Scenario 4 – Recordings during the execution of the scenario in the form of a cinematic decision tree will be displayed as a 360-degree sphere. The user's viewpoint is positioned in the center of the sphere and can rotate around in three degrees of freedom. If the user changes their position, the sphere moves with them, ensuring that regardless of the user's movement, they will always remain at the center of the sphere. Therefore, the recommended way to use the scenario is for the user to stand or sit during its execution. The scenario consists of a cinematic decision tree, so when a decision needs to be made, the film pauses while waiting for the user's choice. At that moment, options for continuing the film appear before the user. After selecting an option, the user continues the scenario according to the chosen branch of the tree. If the final decision is made, the scenario will automatically switch to the results screen, presenting a summary of the scenario execution based on the decisions made.
- I** Scenario 5 – The scenario will be visualized as an interactive 3D world where the user can move freely using their body movements or a teleportation mechanism that allows the user to teleport to a location indicated by their hand. The scene will resemble an office with computer equipment. During the execution of the scenario, the user will be able to interact with objects by touching them with their hand and pressing a button on the controller, or (if the object allows) to grab and move it as desired.

The concept of visualizing the selection of options for scenarios 1 to 4 is illustrated in the following conceptual images:



The concept of visualizing scenario 5 is presented in the following conceptual image:



The camera used for recording the 360-degree VR footage is the Insta360 ONE RS 1-Inch 360.



Diaphragm	F 2.2
Equivalent focal length 35mm	6.52mm
Photo resolution	6528x3264 (2:1)
Video resolution	<ul style="list-style-type: none"> • 5888x2944@30fps • 6144x3072@25/24fps • 3840x1920@30/25/24fps • 3040x1520@50fps
Photo format	<ul style="list-style-type: none"> • insp • RAW (dng) (raw files require export using Insta360 Studio software available for PC/Mac)
Video format	insv (export to other formats is possible through the mobile app or via Insta360 Studio)
Photography modes	Standard, HDR, Interval, Starlapse, Burst, PureShot
Video modes	Standard Video, Timelapse, TimeShift, Loop Recording
Color profiles	Standard, Vivid, LOG
Weight	239g
Dimensions (Width x Height x Depth)	53.2 x 49.5 x 129.3mm
Battery life	62 minutes tested under laboratory conditions while recording at 6K@30fps
Maximum video bitrate	120Mbps
Gyroscope	6-axis
Compatible devices	<ul style="list-style-type: none"> • Android: Compatible with mobile devices running Android that meet the following parameters: Devices with Android using Kirin 980 chips or newer, including Huawei Mate 20, P30 models or newer. Devices with Android using Snapdragon 845 chips or newer, including Samsung Galaxy S9, Xiaomi Mi 8 models or newer. Devices with Android using Exynos 9810 chips or newer, including Samsung Galaxy S9, S9+, Note9 models or newer. Devices with Android and Tensor chips, including Google Pixel 6.

Compatible devices	<ul style="list-style-type: none"> iOS: Compatible with iOS mobile devices with A11 chips or newer and iOS version 11.0 or newer, including iPhone SE 2, iPhone 8, iPhone 8 Plus, iPhone XR, iPhone XS, iPhone XS Max, iPhone X, iPhone 11, iPhone 11 Pro, iPhone 11 Pro Max, iPhone 12, iPhone 12 Pro, iPhone 12 Pro Max, iPhone 12 mini, iPhone 13, iPhone 13 Pro, iPhone 13 Pro Max, iPhone 13 mini, iPad Air (2020), iPad Pro, and newer.
MicroSD card	UHS-I V30 in exFAT format with a maximum capacity of 1TB
Live Streaming	360 Live, Reframe Live (The streamer sets a fixed perspective)
Exposure value (EV)	±4EV
ISO range	100-3200
Shutter speed	<ul style="list-style-type: none"> Photos: 1/8000 - 120s Video: 1/8000 - up to the frame rate limit available for the given mode
White balance	2000K-10000K
Audio modes	<ul style="list-style-type: none"> Wind Reduction (Wind noise reduction) Stereo
Audio format	48 kHz, AAC
Bluetooth	BLE 5.0
Wi-Fi	5 GHz, 802.11ac (Standard range of about 20 meters, with a maximum transmission speed of 20MB/s)

Videos for the application will be recorded at a resolution of 5888 x 2944 at 30 Hz. They will then be converted into a color texture for the sphere surrounding the user and down-scaled to an appropriate resolution to ensure smooth interaction with the application. The application will be rendered at a frequency of 70 Hz; however, the videos will generally be at 30 Hz.

The adopted method for visualizing the content of scenarios for the web version of the application:

- Scenario 1 – During the execution of the scenario, the recordings in the form of a filmic decision tree will be displayed as a classic film cut from the recorded 360-degree sphere. The cut segment will present the point of view of the scenario's character without the possibility of changing it. The user will be able to interact with the scenario by pressing the interaction buttons displayed below the scenario. Since the scenario consists of a filmic decision tree, the film will pause at the moment a decision needs to be made, waiting for the user's choice. Then, options for continuing the film will appear below the video. After the user selects an option, they will continue the scenario according to the chosen branch of the tree. If the last decision has been made, the scenario will automatically switch to the results

screen, presenting a summary of the scenario execution based on the decisions made.

- I** Scenario 2 – During the execution of the scenario, the recordings in the form of a filmic decision tree will be displayed as a classic film cut from the recorded 360-degree sphere. The cut segment will present the point of view of the scenario’s character without the possibility of changing it. The user will be able to interact with the scenario by pressing the interaction buttons displayed below the scenario. Since the scenario consists of a filmic decision tree, the film will pause at the moment a decision needs to be made, waiting for the user’s choice. Then, options for continuing the film will appear below the video. After the user selects an option, they will continue the scenario according to the chosen branch of the tree. If the last decision has been made, the scenario will automatically switch to the results screen, presenting a summary of the scenario execution based on the decisions made.
- I** Scenario 3 – The recordings during the execution of the scenario, presented as a filmic decision tree, will be displayed as a classic film cut from the recorded 360-degree sphere. The cut segment will depict the point of view of the scenario’s character, without the possibility of changing it. The user will be able to interact with the scenario by pressing interaction buttons displayed below the scenario. Since the scenario consists of a filmic decision tree, the film will pause at the moment a decision needs to be made, waiting for the user’s choice. At that point, options for continuing the film will appear below the video. After the user selects an option, they will continue the scenario according to the chosen branch of the tree. If the last decision has been made, the scenario will automatically switch to the results screen, presenting a summary of the scenario execution based on the decisions made.
- I** Scenario 4 – The recordings during the execution of the scenario, presented as a filmic decision tree, will be displayed in the form of a classic film cut from the recorded 360-degree sphere. The cut segment will represent the point of view of the scenario’s character, without the possibility of changing it. The user will be able to interact with the scenario by pressing interaction buttons displayed below the scenario. Since the scenario consists of a filmic decision tree, the film will pause at the moment a decision needs to be made, waiting for the user’s choice. At that point, options for continuing the film will appear below the video. After the user selects their preferred option, they will continue the scenario according to the chosen branch of the tree. If the last decision has been made, the scenario will automatically switch to the results screen, presenting a summary of the scenario execution based on the decisions made.
- I** Scenario 5 – not available in the web application.

Adopted method of interaction with the VR world

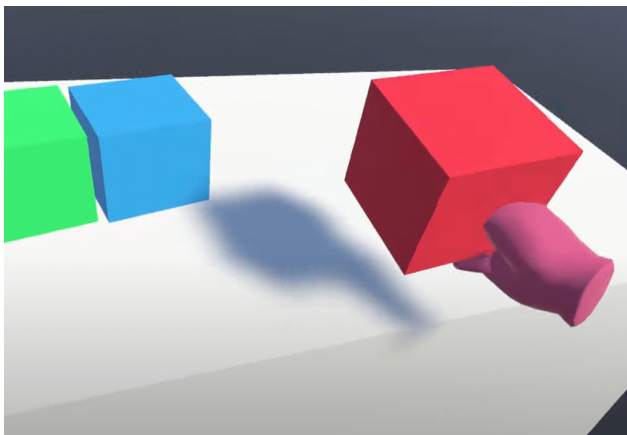
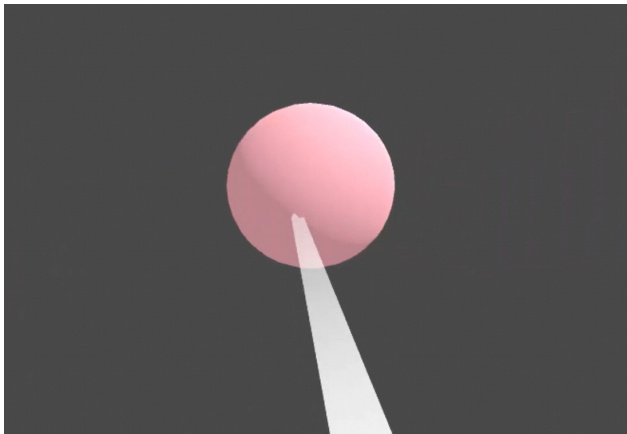
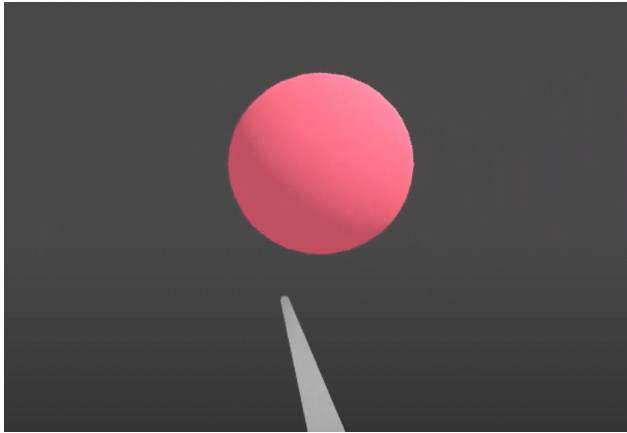
In the VR4SKILLS application, depending on its version, various forms of interaction with the application are allowed.

Planned methods of operating the VR application:

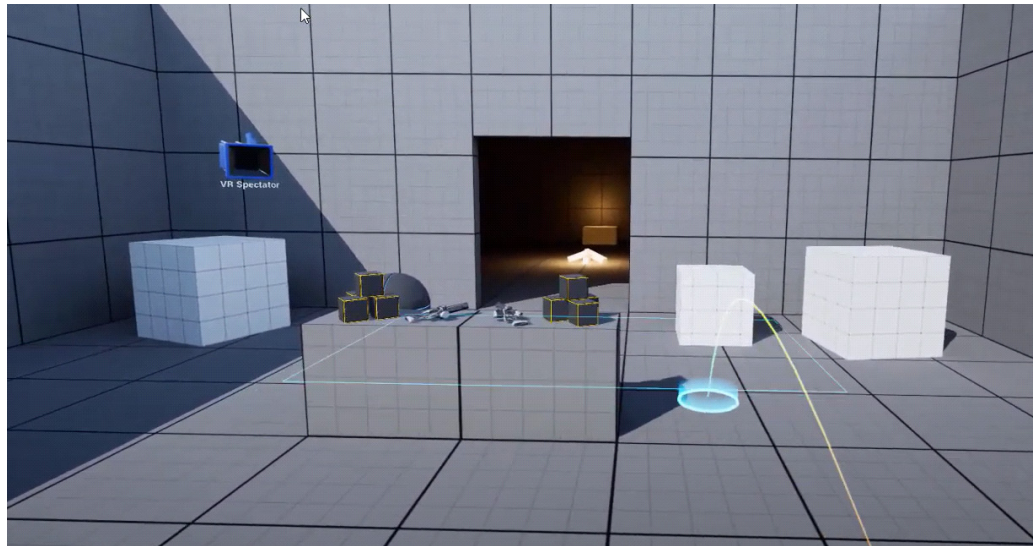
- Option 1 - Turning the head to center the element of interest and maintaining this position for at least 1 second. For convenience, a dot is displayed in the center of the user's field of view. The user should point this dot at the element they wish to interact with for at least 1 second. Performing this action is interpreted as the user's intent to interact with the visible active element at that location. This form of interaction will work in scenarios 1, 2, 3, and 4, as well as on the results summary screen. A filling circle indicates to the user how much longer they should look at the element to interact with it. If the user changes their object of interest (looks at anything else) before the required interaction time is completed, the timer resets.



- Indicating a specific active element with a beam starting from the VR controller (the participant's hand) and pressing a button on the controller (typically the largest button on the controller, known as the trigger). This form of interaction will work in the menu, on the results summary screen, and in scenarios 1, 2, 3, 4, and 5 (i.e., on all screens of the application). If an interactable element is indicated, the interaction will be triggered (e.g., the selected option to continue the scenario), or if the object allows for grabbing, it will be held until the button is released (in scenario 5).



- Pressing the teleport button, which displays a beam starting from the VR controller (the participant's hand), and then pointing to an empty space on the floor with that beam. When the user releases the button, they will be teleported to the indicated free space on the floor. If the space is not free or does not exist on the floor, the teleportation will not occur.

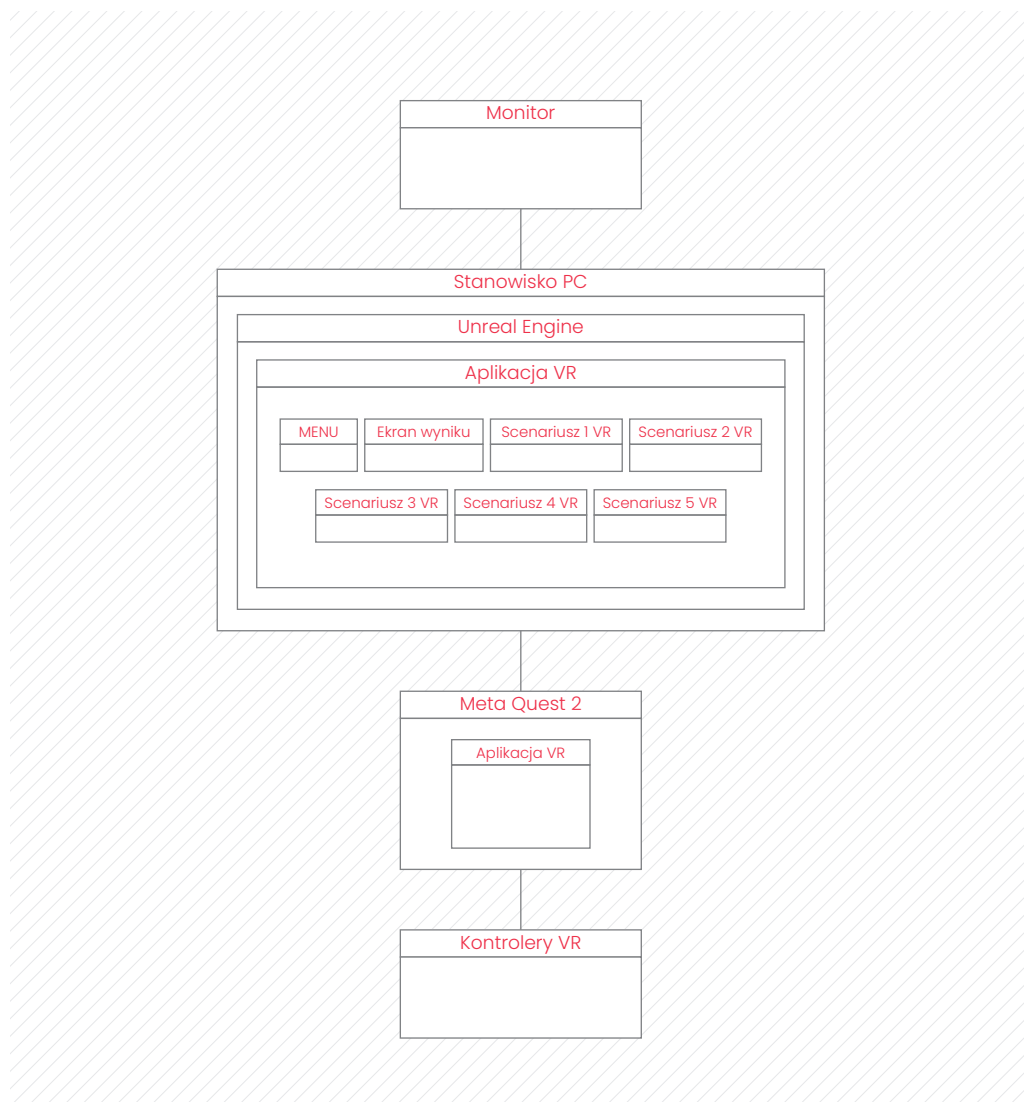


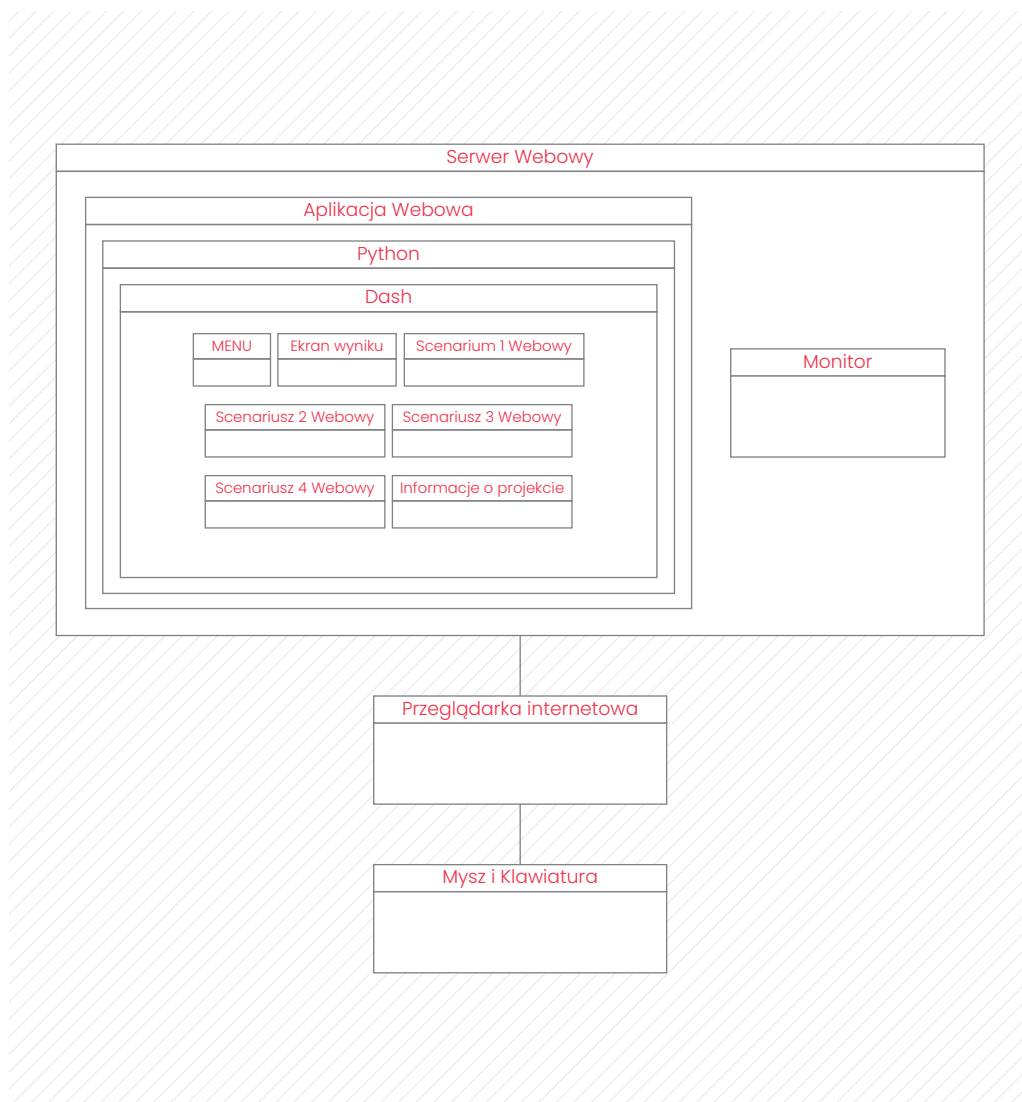
Determination of difficulty levels

In the VR4SKILL application, each scenario has been designed with one fixed difficulty level, which was precisely defined during the requirements specification phase by the Client. This means that all tasks and challenges within the scenarios are tailored to this predetermined difficulty level, ensuring a consistent experience for all users.

The application does not offer an option to change or adjust the difficulty level, guaranteeing that every user goes through the same standard training process in line with the project's assumptions. This design approach ensures consistency in assessing skills and outcomes, eliminating the possibility of modifying difficulty to meet individual needs.

Application Architecture – Component Diagram



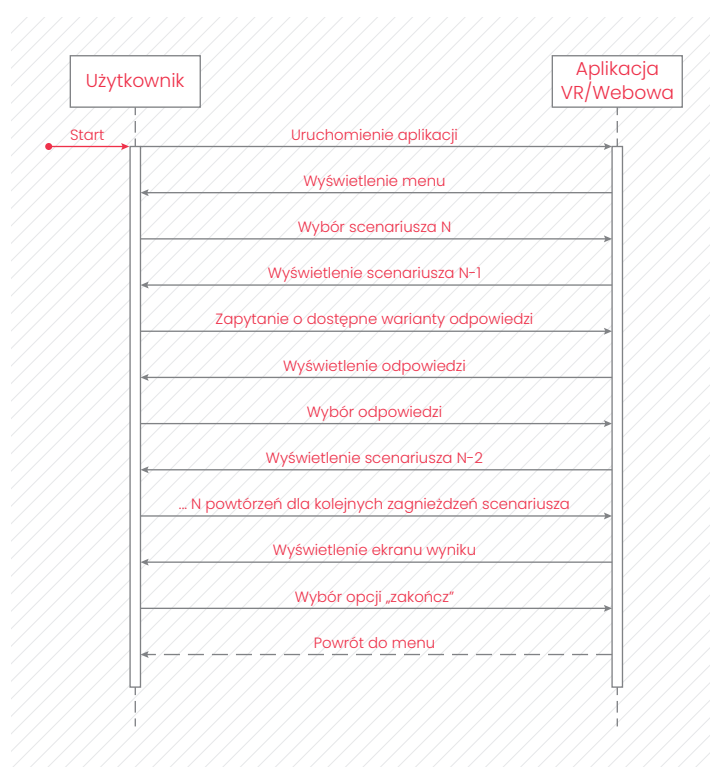


TRANSLATIONS:

- | Monitor - Monitor
- | Stanowisko PC - PC Station
- | Unreal Engine - Unreal Engine
- | Aplikacja VR - VR Application
- | MENU - MENU
- | Ekran wyniku - Result Screen
- | Scenariusz 1-5 VR - Scenario 1-5 VR
- | Meta Quest 2 - Meta Quest 2

- | Aplikacja VR – VR Application
- | Kontrolery VR – VR controllers
- | Serwer Webowy – Web Server
- | Aplikacja Webowa – Web Application
- | Python – Python
- | Dash – Dash
- | MENU Webowa – Web MENU
- | Ekran wyniku – Result Screen
- | Scenariusz 1-4 Webowy – Web Scenario 1-4
- | Informacje o projekcie – Project Information
- | Baza Danych MYSQL Server – MYSQL Server Database
- | Przegladarka internetowa – Internet browser
- | Mysz i klawiatura – Mouse and Keyboard

Sequence Diagram

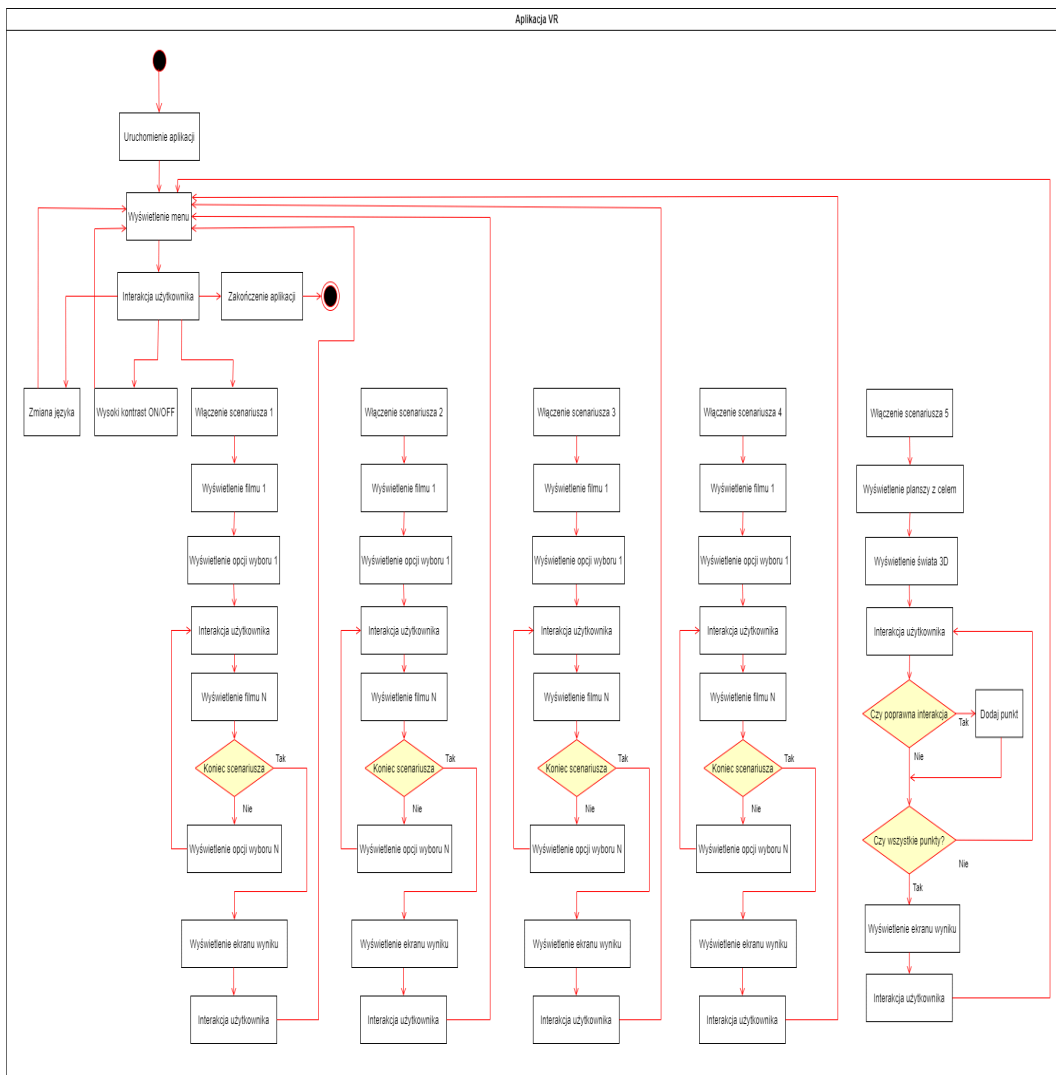


TRANSLATIONS:

- | Uzytkownik - User
- | Aplikacja VR/Webowa - VR/Web Application
- | Uruchomienie aplikacji - Launching the Application
- | Wświetlenie menu - Display Menu
- | Wybór scenariusza N - Scenario selection N
- | Wświetlenie scenariusza N-1 - Displaying scenario N-1
- | Zapytanie o dostępne warianty odpowiedzi - Inquiry about available answer variants
- | Wświetlenie odpowiedzi - Displaying the answer
- | Wybór odpowiedzi - Answer Choice
- | Wświetlenie scenariusza N-2 - Displaying scenario N-2
- | (...) N powtorzen dla kolejnych zagniezdzen scenariusza - (...) N repetitions for subsequent scenario nestings
- | Wświetlenie ekranu wyniku - Displaying the market result screen
- | Wybór opcji "zakoncz" - Selecting option "Finish"
- | Powrot do menu - Back to Menu



Activity Diagram



TRANSLATIONS:

- | Aplikacja VR – VR APPLICATION
- | Uruchomienie aplikacji – Launching the Application
- | Wyświetlenie menu – Display Menu
- | Interakcja użytkownika – User Interaction
- | Zakonczenie aplikacji – Application completion
- | Zmiana języka – Change Language
- | Wysoki kontrast ON/OFF – High Contrast ON/OFF
- | Włączenie scenariusza 1-5 – Enabling scenario 1 - 5
- | Wyświetlenie filmu 1 – Showing movie 1
- | Wyświetlenie planszy z celem – Displaying the board with the goal
- | Wyświetlenie opcji wyboru 1 – Displaying election option 1
- | Wyświetlenie świata 3D – Displaying the 3D world
- | Interakcja użytkownika – User Interaction
- | Wyświetlenie filmu N – Showing the movie N
- | Czy poprawna interakcja – Is this the correct interaction?
- | Dodaj punkt – Add point
- | Koniec scenariusza – End of Scenario
- | Wyświetlenie opcji wyboru N – Displaying the selection option N
- | Czy wszystkie punkty? – Are all points?
- | Wyświetlenie ekranu wyników – Displaying the market result screen
- | Interakcja użytkownika – User Interaction
- | Tak – Yes
- | Nie – No

The adopted method for executing scenario number 1 in VR

Due to the implementation and requirements, the scenario described in the following part of the document is presented in English.

Title of the scenario: "Scenario Intercultural Effectiveness".

Sample props categorized by location (All rooms should have elements indicating that the location is within a university building. These elements should be in English and should not specify any particular university):



- I International Relations Office:
 - I Desks, computers, chairs;
 - I Documents and office supplies;
 - I Calendars, task boards/
- I Meeting with International Students:
 - I Conference table, chairs;
 - I Notebooks, pens;
 - I Sample course materials.
- I Task force for event organization:
 - I Planning board;
 - I Laptops, phones;
 - I Informational brochures, promotional materials.
- I Scenes related to stress management:
 - I Coffee/tea cups;
 - I Notepad with a task schedule;
 - I Wall clock or watch.

Character Descriptions:

- I Sarah:
 - I Leader, employee of the International Relations Office, empathetic, organized, able to work effectively under pressure, but prone to stress.
 - I Outfit: formal, business attire.
- I Colleague 1 (Jack):
 - I Logistics specialist, experienced, responsible for organizing event venues.
 - I Outfit: casual, neat.
- I Colleague 2 (Emily):
 - I Responsible for communication with speakers and guests, communicative, and organizationally skilled.
 - I Outfit: formal, elegant.
- I Colleague 3 (Mike):
 - I Promotion and marketing specialist, creative, responsible for promoting the event.

- | Outfit: casual, modern.

- | **Colleague 4:**

- | Team member responsible for communication with the university administration, focused on partnership strategies.

- | Outfit: formal, business attire.

- | **Emilio:**

- | International student, project team leader, facing challenges related to cultural differences within the group.

- | Outfit: casual, student-style.

- | **International Students (1-4):**

- | Students from various countries, each with unique adaptation challenges.

- | Outfit: casual, student-style.

- | **John and Paul:**

- | Two students in conflict: John feels ignored, while Paul feels that his ideas are being overlooked.

- | Outfit: casual, student attire.

- | **Nico:**

- | Role: A colleague who supports Sarah.

- | Traits: Support-oriented, empathetic, advisory.

- | Outfit: Informal, casual.

- | Description: Nico acts as a mentor or support for Sarah during difficult times. His role is to advise Sarah on stress management and task organization. He encourages her to use time management techniques, delegate tasks, and take care of her mental health. Nico serves as a voice of reason and emotional support, helping Sarah cope better with challenges at work.

- | **Mark:**

- | Role: Sarah's colleague.

- | Traits: Practical, task-focused, efficiency-oriented.

- | Outfit: casual, tidy.

- | Description: Mark is a character who responds to Sarah's fatigue by suggesting that she take a break and think about the best way to approach her workload. His role is to remind Sarah of the need to maintain a balance between work and rest to avoid burnout.



- | Paulina:
 - | Role: Sarah’s team colleague.
 - | Traits: Organized, supportive, communicative.
 - | Outfit: Formal, elegant.
 - | Description: Paulina supports Sarah in team management and task delegation. She suggests clear communication channels, which helps minimize misunderstandings and ensures effective task distribution. Her role is crucial in building an efficient team, fostering collaboration and open communication.

Sample descriptions of rooms:

- | International Relations Office:
 - | Modern office with space for teamwork.
 - | Bright lighting, neutral wall colors.
 - | The central spot is Sarah’s desk with a computer and documents.
- | Meeting room:
 - | Spacious room with a large conference table.
 - | Walls adorned with world maps and flags of various countries.
 - | Comfortable chairs for participants, a projector or screen for presentations.
- | Office space for the event organizing team:
 - | Open office with a large planning board on the wall.
 - | Workstations equipped with laptops, documents, and event plans.

Division into dialogues and variants (in English):

Day 1

Scene 1: Introduction

Spoken text:

Sarah: (Entering the International Relations Office with a smile) Good morning Everyone!

Colleague 1: Morning, Sarah. Ready for another busy day?

Sarah: Absolutely. Let’s see what’s on the agenda today.

Scene 2: Meeting International Students

Spoken text:

Sarah sits down with a group of International Students who are struggling to adapt to the new cultural environment

Sarah: (Warmly) Hello Everyone!. Thank you for meeting with me today. I understand that transitioning to a new cultural environment can be challenging. How are you all feeling?

International Student 1: (Frustrated tone) I just don't get why everyone here does things differently

Sarah: (with empathy) I hear you. It's completely normal to feel that way when adjusting to a new culture. Can you tell me more about what specific challenges you are facing?

International Student 2: (Anxiously) I'm struggling to keep up with my coursework because I don't understand what's expected of me in class. The teaching style is so different here.

Sarah: (Understanding) That sounds tough. It's important to remember that each culture has its own academic expectations and communication style. We can work together to help you navigate these differences

International Student 3: (Hesitantly) I feel like I don't belong here. It's hard to connect with my classmates because of the language barrier and cultural differences.

Sarah: (Encouraging) Building connections takes time, but I'm here to support you.

International Student 4: (Warily) I'm worried about making friends. It seems like everyone already has their own social circles, and I'm struggling to find my place.

Sarah: (Assuring) You are not alone in feeling that way. Many students experience similar challenges when starting university.

Displayed text:

What should Sarah do to help the students? Here are three possible approaches she can take:

Option 1: Individualized Support

Sub-option 1.1 Individual Support

Spoken text:

Sarah: We can schedule one-to-one meetings to address your specific challenges and provide personalized guidance and support.

International Student: (Relieved) That sounds great. I feel like I could use some individual attention to really understand everything.

Sarah: I'll make sure to set up appointments that work for both of us.

Consequences (displayed at the end of this option scene) The individualized support allows Sarah to address each student's unique challenges effectively, providing tailored solutions; Students feel valued and supported, leading to increased confidence and motivation to succeed; Sarah builds stronger relationships with the students, fostering trust and open communication; Sarah might become overwhelmed with the workload of scheduling and conducting individual meetings, leading to burnout or decreased ef-



fectiveness in providing support; Due to exhaustion or time constraints, Sarah may not be able to provide the same level of attention and care to each student, resulting in inconsistent support experiences.

Sub- option 1.2 Flexible Communication Channels

Spoken text:

Sarah: In addition to one-to-one meetings, we can also utilize email or a messaging platform for ongoing communication to address your questions and concerns promptly.

International Student (Appreciative): That would be helpful, especially when I have urgent questions outside of scheduled meetings.

Sarah: I'll ensure that we have open communication channels for continuous support.

Displayed text:

Consequences (displayed at the end of this option scene) Students can seek support at their convenience, leading to timely assistance and reduced frustration. Flexible communication channels provide continuous support, fostering a supportive environment for students. Sarah's responsiveness demonstrates her commitment to addressing students' needs, enhancing trust and satisfaction. But on the other hand Sarah may become overwhelmed by the volume of communication, leading to delays or oversights in responding to students. Moreover, without face-to-face interaction, there's a risk of misunderstanding or misinterpretation of information, affecting the effectiveness of support. Students may rely too heavily on digital communication, neglecting opportunities for in-person interaction and support.

Sub-option 1.3: Peer Tutoring

Spoken text:

Sarah: We can connect you with peer tutors who have excelled in similar courses and can provide academic assistance tailored to your needs.

International Student (Curious): Having support from someone who has been through the same courses would be beneficial.

Sarah: I'll find suitable peer tutors for you and facilitate the tutoring sessions as needed.

Displayed text:

Consequences (displayed at the end of this option scene) Peer tutoring offers personalized assistance, enhancing students' understanding and academic performance. Building relationships with peer tutors fosters a sense of community and belonging among students. However, the effectiveness of peer tutoring may vary depending on the tutor's skills and availability, potentially leading to inconsistent support experiences. Students may become overly reliant on peer tutors, diminishing their independence and problem-solving skills. Coordinating peer tutoring sessions may consume additional time and resources, potentially straining Sarah's workload.

Option 2 Group Study Session

Sub- option 2.1. Study session

Spoken text:

Sarah: We can organize group study sessions where you can collaborate with other International students facing similar challenges

International Student (Excited): I think that would be really helpful. It's comforting to know I'm not the only one struggling.

Sarah: We'll coordinate the sessions and make sure they're productive for everyone involved

Displayed text:

Consequences ((displayed at the end of this option scene) Group study sessions provide a supportive environment where students can share experiences and learn from each other; Students feel a sense of belonging, reducing feelings of isolation and increasing motivation to excel academically; Sarah facilitates productive group discussions and ensures that each session meets the needs of the participants

Sub- option 2.2 Facilitated Discussions

Spoken text:

Sarah: During the group study sessions, we can incorporate facilitated discussions on cultural adjustment strategies and academic challenges to ensure everyone benefits from shared insights. **International Student (Interested):** That sounds valuable. It would help us focus on specific issues and learn from each other's experiences.

Sarah: I'll prepare discussion topics that address common concerns and guide the sessions to maximize their effectiveness.

Displayed text:

Consequences Facilitated discussions promote deeper engagement and learning among participants, encouraging collaborative problem-solving and knowledge sharing. Sarah enhances the effectiveness of group study sessions by providing structure and direction, facilitating meaningful exchanges among students. Without effective facilitation, certain participants may dominate discussions, hindering the participation of others. Lack of structure or guidance may result in discussions veering off-topic, reducing the effectiveness of the sessions. Sarah may encounter challenges in managing conflicts or disagreements during discussions, potentially leading to tension or discomfort among participants.

Sub-option 2.3 Guest Speakers

Spoken text:

Sarah: We can invite guest speakers, such as faculty members or alumni, to share their



experiences and provide advice during the group study sessions.

International Student (Excited): Hearing from experts and experienced individuals would provide valuable insights.

Sarah: I'll arrange for guest speakers to attend our sessions and ensure they cover topics relevant to your academic and cultural adjustment.

Displayed text:

Consequences Guest speakers offer diverse perspectives and expertise, enriching the learning experience and inspiring students to overcome challenges. Sarah enhances the quality of group study sessions by incorporating external perspectives and expertise, fostering a dynamic and enriching environment for participants. However, securing guest speakers may be challenging due to scheduling conflicts or availability, potentially disrupting planned sessions. Guest speakers may not always address topics directly relevant to students' needs or interests, diminishing the impact of their presentations. Coordinating guest speaker sessions may require additional time and resources, posing logistical challenges for Sarah and the participants.

Option 3 Cultural Mentoring Program

Spoken text:

Sarah: we can implement a cultural mentorship program pairing international students with domestic students who can provide guidance and support

International Student: (Intrigued) That sounds interesting. It might be nice to have a peer who understands the local culture and can help me to navigate it.

Sarah: I'll check the feasibility of such a program and keep you updated on our progress

Displayed text:

Consequences (displayed at the end of this option scene) The cultural mentorship program promotes cross-cultural understanding and fosters meaningful connections between international and domestic students; International students receive valuable insights and support from their mentors, helping them integrate into the local community more smoothly; Sarah collaborates with university stakeholders to launch the program successfully, demonstrating her commitment to supporting students success.

Option 4 Dropping out

Spoken text:

Sarah: Well, if you feel that way, dropping out might be the best choice. It's important to prioritize your mental health and well-being.

International Student: Oh... I see. Maybe you're right. I'll think about it some more. (student leaves looking dejected)

Displayed text:

Consequences (displayed at the end of this option scene) The student feels discouraged by Sarah's lack of support and guidance, leading to a sense of isolation and hopelessness. Without exploring alternative solutions, the student may drop out impulsively, missing out on opportunities for academic success and personal growth. The negative reinforcement from Sarah reinforces the student's doubts and undermines their confidence in seeking help from the university in the future.

Day 2

Displayed text:

The office hums with activity as Sarah, diligently attends her duties. A hesitant knock at the door draws her attention. Emilio, a student, stands outside, looking troubled.

Spoken text:

Sarah: (warmly) Emilio, please come in. How can I help you?

Recording comment: Emilio enters the office, visibly distressed, and takes a seat.

Emilio: Thank you, Sarah. I'm having some serious issues with my group project. You see, my teammates come from diverse cultural backgrounds, and while that's usually a strength, it's causing significant friction now. We just can't seem to agree on anything, and our project is suffering because of it.

Recording comment: Sarah listens attentively, nodding in understanding.

Sarah: I see Emilio. Cultural differences can indeed present unique challenges, especially in collaborative settings like your group projects. Could you provide more insight into specific cultural dynamics at play here?

Recording comment: Emilio hesitates, then opens up about the underlying cultural misunderstandings and communication barriers within his group. He explains how differing approaches to teamwork, decision-making, and conflict resolution have led to tension and impeded progress on their project.

Sarah: Thank you for sharing that, Emilio. Understanding the root causes of the problem is first step towards finding a solution. Now let's explore some possible approaches

Option 1 Facilitate Cultural Dialogue Sessions

Spoken text:

Sarah: Emilio, I believe organizing facilitated dialogue sessions would be the best approach in this situation. It will provide a structured environment for you and your teammates to express your cultural perspectives and find common ground Emilio: (skeptically) Are you sure that's the right way to go? Won't it just lead to more arguments and disagreements?

Sarah: I understands your concerns, Emilio, but I believe open and respectful dialogue

is key to overcoming cultural differences. By addressing these issues head-on, we can foster mutual understanding and ultimately strengthen your team's collaboration

Emilio: (reluctantly) Alright, if you think it's the best option, let's give it a try.

Displayed text:

Consequences (displayed at the end of this option scene) The facilitated dialogue sessions initially lead to heated debates and increased tension among Emilio and his teammates. However, as they gradually begin to find common ground and develop a deeper appreciation for their cultural differences, Eventually, they are able to resolve their conflicts and successfully complete their project, but not without enduring significant stress and setbacks along the way

Option 2 Team Building Activities

Spoken text:

Sarah: Emilio, I suggest arranging team- building activities tailored to address your group's specific challenges. These activities will help promote trust, empathy, and effective communication among your teammates, fostering a stronger sense of unity and collaboration.

Emilio: That sounds interesting. How do you think it will help us overcome our cultural differences?

Sarah: By engaging in interactive exercises and problem- solving tasks together, you'll have the opportunity to build rapport and develop a deeper understanding of each other's strengths and communication styles. Through shared experiences, you can break down barriers and cultivate a more cohesive team dynamic.

Emilio: (optimistically) I like the sound of that. Let's give it a try

Displayed text:

Consequences (displayed at the end of this option scene) The team building activities prove to be highly successful in fostering trust, cooperation, and mutual respect among Emilio and his teammates. As they work together to overcome various challenges, they develop stronger bonds and gain a deeper appreciation for their cultural differences. With improved communication and a newfound sense of unity, they are able to collaborate more effectively and successfully complete their project, achieving both personal and academic success.

Option 3 Peer Mediation

Spoken text:

Sarah: We can ask for help of a trained peer mediator to facilitate constructive discussions and negotiations between you and your teammates.

Emilio: (intrigued) How exactly would that work?

Sarah: The mediator would serve as a neutral third party, guiding the group towards mutually acceptable solutions and helping you navigate your cultural differences more effectively. By providing a structured framework for communication and conflict resolution, peer mediation can help you address your concerns in a constructive and respectful manner.

Emilio: That sounds like it could really help us move past our differences. Let's give it a try

Displayed text:

Consequences ((displayed at the end of this option scene) With the assistance of a trained peer mediator, Emilio and his teammates engage in productive discussions and negotiations aimed at resolving their conflicts. The mediator facilitates open communication and encourages each member to express their perspectives and concerns openly. Through this process, the group gains a deeper understanding of each other's viewpoints and learns to appreciate their cultural differences. With tensions diffused and a renewed sense of cooperation, they are able to work together more effectively and successfully complete their project with minimal stress and friction.

Day 3

Displayed text:

Sarah and her colleagues from International Relations Office are sitting together and they are having a discussion about an event they need to organize. Unfortunately, there's no much time to organize an event and they have a limited resources to do it.

Spoken text:

Sarah: (Examining the task at hand) Alright team, we've got a Staff week to organize with limited time and resources.

Narrator: (or displayed information) Sarah as leader of the group needs to make a decision how to effectively manage the team and organize an event. Here are her options:

Option 1: Delegate tasks to her team members and trust their expertise.

Spoken text:

Sarah: Alright team, let's divide and conquer. Jack, I need you to handle venue bookings and logistics. Emily, can you take care of reaching out to potential speakers and guests? And Mike, please oversee the promotion and marketing efforts.

Jack: Got it, I'll start looking into available venues right away.

Emily: Sure thing, I'll start drafting emails to invite speakers and guests.

Mike: No problem, I'll work on creating social media posts and spreading the word about the event.



Displayed text:

Consequences ((displayed at the end of this option scene) By delegating tasks and trusting her team members' expertise, Sara fosters a sense of ownership and empowerment among her colleagues. The event planning process becomes more efficient, with each team member contributing their unique skills and ideas. However, there might be a risk of miscommunication or misunderstanding among team members if tasks are not delegated clearly, leading to confusion and potential delays in the event planning process. So, Sarah in order to show her leadership skills

Hold a Briefing Meeting

Spoken text:

Sarah: Alright team, before we dive into our tasks, let's have a quick briefing meeting to ensure we're all clear on what needs to be done.

Jack: Sounds good, Sarah. It'll help us understand the big picture.

Emily: Agreed. I think clarifying expectations from the start will prevent any misunderstandings later on.

Mike: I'm all for it. A briefing meeting will ensure we're aligned on our goals and responsibilities.

Displayed text:

Consequences ((displayed at the end of this option scene) Ensure everyone is on the same page regarding their responsibilities. But it may take some time initially, potentially delaying task execution.

Establish Clear Communication Channels

Spoken text:

Sarah: Let's establish clear communication channels to keep everyone in the loop. Jack, can we set up a Basecamp channel specifically for this project?

Jack: Sure thing, Sarah. I'll create the channel and invite everyone to join.

Emily: Should we also schedule regular check-ins or have an open-door policy for any questions or concerns?

Mike: I think both could work. Scheduled check-ins will keep us accountable, and an open-door policy ensures we address issues promptly.

Displayed text:

Consequences (displayed at the end of this option scene) On one hand it minimizes misunderstandings and ensures quick resolution of any issues. But, constant communication might consume additional time, affecting productivity.

Option 2: Take full control of the project to ensure everything goes smoothly.

Spoken text:

Sarah: I'll take the lead on this one. I'll assign tasks and oversee every aspect of the event to ensure it's a success.

Emily: But Sarah, we have skills and ideas to contribute too. We can work together more effectively if we share the workload.

Displayed text:

Consequences ((displayed at the end of this option scene) Sarah's decision to take full control leads to resentment and disengagement among her team members. They feel sidelined and undervalued, resulting in decreased morale and productivity. Sarah becomes overwhelmed trying to micromanage every aspect of the event, leading to unnecessary stress and exhaustion. Despite her efforts, the event lacks the creativity and diversity of ideas that could have been achieved through collaboration.

Option 3: Collaborate closely with one team member while excluding the others.

Spoken text:

Sarah: Emily, I think you and I should handle this together. John, you can assist us if needed.

John: Wait, why am I being excluded? We're a team, aren't we?

Sarah: Trust me, this is the best approach.

Displayed text:

Consequences (displayed at the end of this option scene) Sarah's decision to exclude certain team members creates tension and division within the group. The excluded members feel marginalized and unappreciated, leading to a breakdown in trust and communication. The event planning process becomes disjointed and inefficient, with key tasks overlooked or poorly executed. Ultimately, the event suffers from a lack of cohesion and teamwork, reflecting poorly on Sarah's leadership abilities.

Option 4: Prioritize Essential Tasks

Spoken text:

Sarah: Alright team, we need to prioritize. Let's focus on securing the venue and confirming the speakers first. Everything else can wait until we have those key elements in place.

Jack: Understood, I'll prioritize venue options and start reaching out for availability.

Emily: Makes sense, I'll work on securing commitments from potential speakers before we move on to other tasks.



Mike: Sure thing, I'll hold off on marketing efforts until we have more concrete details to promote.

Displayed text:

Consequences ((displayed at the end of this option scene) By focusing on the most critical tasks first, Sarah ensures that key aspects of the event are addressed promptly, maximizing the limited time and resources available. There's a risk of neglecting important but less urgent tasks, potentially compromising the quality of the event in the long run. So, Sarah has to decide what do to avoid neglecting them.

Conduct a Task Priority Analysis

Spoken text:

Sarah: Before we start, let's conduct a quick analysis to prioritize our tasks. Jack, what do you think should be our top priority?

Jack: Securing the venue should be our main focus. Everything else hinges on having a location confirmed.

Emily: Agreed. Once we have the venue, we can move on to securing speakers and promoting the event.

Mike: Makes sense. I'll prioritize tasks based on their dependencies and importance to the overall event.

Displayed text:

Consequences ((displayed at the end of this option scene) Definitely it helps in identifying critical tasks and allocating resources accordingly. But may lead to overlooking tasks that seem less urgent but are still important in the long run.

Set Clear Deadlines for Each Task

Spoken text:

Sarah: Let's set clear deadlines for each task to ensure we stay on track. Jack, when do you think you can have a list of potential venues ready?

Jack: I'll aim to have it by the end of the day tomorrow, Sarah.

Emily: I'll make sure to reach out to speakers within the next two days to secure their commitments.

Mike: I'll start drafting the marketing plan and aim to have it finalized by the end of the week.

Displayed text:

Consequences (displayed at the end of this option scene) It ensures tasks are completed in a timely manner, preventing last-minute rushes. On the other hand, it may increase pressure on team members and result in stress if deadlines are too tight.

Regular Progress Reviews

Spoken text:

Sarah: We need to schedule regular progress reviews to ensure we're meeting our deadlines. How does everyone feel about a weekly check-in meeting?

Jack: That works for me, Sarah. It'll help us stay accountable and address any issues early on.

Emily: Agreed. Weekly meetings will give us a chance to discuss any roadblocks and adjust our plans if needed.

Mike: Sounds good to me. It'll also give us an opportunity to celebrate our achievements and keep morale high.

Displayed text:

Consequences ((displayed at the end of this option scene) It allows Sarah to monitor the progress of essential tasks and intervene if necessary. However, it also requires additional time for meetings, potentially taking away from actual task execution.

Option 5: Streamline Event Format

Spoken text:

Sarah: Team, we might need to streamline our event format to make this work. Let's focus on core activities and trim any unnecessary frills.

Jack: That makes sense, we can look for a venue that offers all-inclusive packages to save time on coordinating multiple vendors.

Emily: Agreed, we can limit the number of speakers or panel discussions to keep the agenda concise and manageable.

Mike: I see your point, but let's make sure we're not sacrificing the wow factor that will attract attendees and make the event memorable. We need to find the right balance between efficiency and impact.

Displayed text:

Consequences ((displayed at the end of this option scene) By simplifying the event format or scaling down certain aspects, Sarah can ensure that the event remains manageable within the constraints of time and resources. There's a risk of compromising the overall impact or appeal of the event if key elements are sacrificed in the interest of streamlining.

Focus on Core Objectives

Spoken text:

Sarah: Let's focus on our core objectives to streamline the event format. What are the essential elements we can't afford to compromise on?



Co-funded by
the European Union

Akademia WSB
WSB University



businet^B
global business education network

avans
university
of applied sciences

Jack: I think the keynote speeches and networking opportunities are non-negotiable. They're what attendees value the most.

Emily: Agreed. We can scale back on extraneous activities but must ensure the quality of our main sessions.

Mike: We should also prioritize attendee engagement and interaction to make the most of our limited resources.

Displayed text:

Consequences ((displayed at the end of this option scene) Focusing on core objectives ensures the event remains aligned with its primary goals, maximizing impact despite limited resources. But, Streamlining too much may result in sacrificing elements that could enhance the event experience, potentially reducing attendee satisfaction.

Simplify Registration and Check-in Processes

Spoken text:

Sarah: How can we simplify our registration and check-in processes to streamline the event?

Jack: We could use online registration forms and QR code check-ins to speed up the process and reduce waiting times.

Emily: We should also provide clear instructions and signage to guide attendees through the registration and check-in process seamlessly.

Mike: Agreed. A smooth registration experience sets the tone for the rest of the event and ensures attendees start off on the right foot.

Displayed text:

Consequences (displayed at the end of this option scene) Simplifying registration and check-in processes reduces wait times and improves attendee experience, enhancing overall event efficiency. However, Implementing new registration and check-in processes may require investment in technology or resources, potentially increasing costs and complexity.

Opt for Pre-packaged Services

Spoken text:

Sarah: Considering our time constraints, should we opt for pre-packaged services where available?

Jack: That might be a good idea, Sarah. It'll save us time on negotiations and coordination.

Emily: As long as we maintain control over the quality and customization, I'm on board with pre-packaged services.

Mike: Agreed. Let's look for packages that offer flexibility and align with our event objectives.

Displayed text:

Consequences (displayed at the end of this option scene) Pre-packaged services save time on negotiations and coordination, allowing for quicker execution of tasks and potentially reducing costs. Lack of customization options with pre-packaged services may result in a less unique or tailored event experience, potentially impacting attendee engagement.

Day 4

Displayed text:

At the university corridor Sarah meets two students who are in conflict and argue with each other.

Spoken text:

Sarah: (Approaching the two students in conflict) Hey, I heard there's been some tension between you two. Let's talk it out and find a solution together.

John: (Frowning) Well, it's just that Paul here doesn't seem to value my input during our group projects.

Paul: (Crossing his arms) And John tends to steamroll over everyone else's ideas without even considering them.

Sarah: I see. It sounds like there's some miscommunication going on. How about we take a moment to discuss what's been happening?

Displayed text:

John and Paul try to explain the situation. Sarah wants to help them, but she should decide what to do and how she can help students.

Option 1: Remain neutral and facilitate a dialogue between the students to find common ground

Spoken text:

Sarah: So, let's start by each sharing our perspective on what happened.

John: Well, I felt like my ideas weren't being taken seriously.

Paul: And I felt like you weren't listening to my suggestions either.

Sarah: I understand where both of you are coming from. Let's see if we can find a compromise that works for both of you.

Displayed text:

Consequences (displayed at the end of this option scene) By remaining neutral and facilitating open communication between the students, Sarah helps them understand



each other's perspectives and find common ground. They work together to resolve their differences amicably, fostering mutual respect and understanding. Sarah earns praise for her empathetic approach and conflict resolution skills, strengthening her relationships with the students and fostering a more inclusive and harmonious environment.

Option 2: Take sides based on her personal biases or preferences.

Spoken text:

Sarah: Alright, I'm siding with Tom here. I think they have a valid point and John should consider their perspective more seriously.

John: That's not fair! You're just taking their side because you agree with them.

Sarah: Well, that's just how I see it.

Displayed text:

Consequences (displayed at the end of this option scene) Sarah's decision to take sides exacerbates the conflict between the students, deepening their animosity towards each other. The student whose side Sarah takes feels validated but the other student feels unfairly treated, leading to increased tension and hostility. Sarah's biased approach undermines her credibility as a neutral mediator and damages her relationships with both students, making it harder to resolve the conflict.

Option 3: Ignore the conflict and hope it resolves itself over time.

Spoken text:

Sarah: (Avoiding the conflict) Oh, I have to run to another meeting. Let's talk about this later when things have calmed down.

John: But we need to resolve this now!

Paul: I'm sure you two can work it out on your own.

Displayed text:

Consequences ((displayed at the end of this option scene) By avoiding the conflict and brushing it aside, Sarah allows tensions to simmer beneath the surface, potentially escalating into a larger problem in the future. The unresolved conflict creates a toxic atmosphere within the international relations office, affecting morale and productivity. Sarah's lack of intervention undermines her role as a leader and mediator, eroding trust and confidence in her ability to handle interpersonal conflicts effectively.

Day 5

Displayed text:

Sarah faces her final challenge, determined to prove her abilities. She is presented with a series of complex tasks and tight deadlines. As she works, her stress levels begin to rise, threatening to overwhelm her. It's been a long and tiring week, but she still has a final project report to submit. Unfortunately the deadline is approaching and her level of stress is increasing.

So what should she do:

Option 1. Push herself to work harder, ignoring her stress levels in pursuit of perfection.

Spoken text:

Sarah: I'll just power through and work late if I have to. It's important to get everything done perfectly.

Colleague: Sarah, you look exhausted. Maybe you should take a break and come back to this later.

Sarah: I can't afford to take a break right now. There's too much to do.

Displayed text:

Consequences (displayed at the end of this option scene) Sarah's decision to push herself beyond her limits results in burnout and decreased performance. She becomes overwhelmed by stress and exhaustion, leading to decreased productivity and effectiveness. Despite her efforts, Sarah struggles to meet deadlines and maintain quality standards, risking her reputation and credibility as a leader. Her health and well-being suffer as a result of chronic stress, impacting her long-term success and happiness.

Sarah is tired and wants to leave her job. But her colleague - Nico comes with some suggestions. What should Sarah do?

Implement time management techniques.

Spoken text:

Sarah: Maybe you're right. I should organize my tasks better. I'll prioritize what's urgent and important.

Nico: That sounds like a good idea. Breaking things down might make it feel more manageable.

Displayed text:

Consequences (displayed at the end of this option scene) Sarah gains valuable insights and support from her mentor, enabling her to develop better coping strategies for managing stress. With a clearer understanding of her strengths and weaknesses, she becomes more resilient in handling challenging situations.

Seek support from a mentor or coach.

Spoken text:

Sarah: You know what? I'll reach out to my mentor for some advice. They might have some strategies to help me cope with this workload.

Nico: That sounds like a wise move. They can offer some valuable insights and support.



Displayed text:

Consequences (displayed at the end of this option scene) By prioritizing tasks and managing her time effectively, Sarah is able to maintain a sense of control over her workload. She experiences reduced stress and improved productivity, allowing her to meet deadlines with higher quality work

Option 2: Take short breaks to recharge and manage her stress levels effectively.

Spoken text:

Sarah: Alright, I'll work for an hour, then take a ten-minute break to clear my mind. That way, I can stay focused and productive without burning out.

Colleague: That sounds like a good plan. Remember to take care of yourself.

Sarah: Thanks, I will.

Displayed text:

Consequences (displayed at the end of this option scene) Sarah's decision to prioritize self-care and take regular breaks allows her to manage her stress levels effectively. She feels more refreshed and focused, enabling her to tackle tasks with renewed energy and clarity. By taking time to recharge, Sarah maintains a healthy work-life balance and avoids burnout. Her productivity and effectiveness improve, leading to better outcomes and increased satisfaction in her work. In order to get better results she can also:

Incorporate mindfulness or relaxation techniques during breaks.

Spoken text:

Sarah: I think during my breaks, I'll try some deep breathing exercises or maybe listen to calming music to help me relax. Nico: That's a great idea. Taking a moment to reset can make a big difference.

Displayed text:

Consequences (displayed at the end of this option scene) Sarah's mindfulness practices during breaks help her to recharge and stay focused. She experiences reduced tension and increased mental clarity, resulting in higher productivity and overall well-being.

Delegate specific tasks related to the project report.

Spoken text:

Sarah: Maybe I should delegate some of these tasks to lighten my load. It's better than trying to do everything myself.

Nico: Absolutely. We're all in this together, Sarah. Let us know what you need help with.

Displayed text:

Consequences (displayed at the end of this option scene) By delegating tasks, Sarah

is able to distribute the workload more evenly among her team members. This not only reduces her stress levels but also fosters a sense of collaboration and teamwork. The project progresses smoothly, and deadlines are met with quality outcomes.

Option 3: Delegate some tasks to her colleagues to alleviate the pressure on herself.

Spoken text:

Sarah: I'll just power through and work late if I have to. It's important to get everything done perfectly.

Mark: Sarah, you look exhausted. Maybe you should take a break and come back to this later.

Sarah: I can't afford to take a break right now. There's too much to do.

Displayed text:

Consequences (displayed at the end of this option scene) Sarah's decision to delegate tasks lightens her workload and promotes teamwork and collaboration. Her colleagues appreciate the opportunity to contribute and support each other, leading to increased morale and productivity. With tasks distributed among multiple team members, the quality of work improves, and deadlines are met more efficiently. Sarah's effective delegation skills enhance her reputation as a capable and considerate leader, earning respect and admiration from her colleagues.

In order to improve her life and work, Sarah suggests:

Establish clear communication channels for task delegation.

Spoken text:

Sarah: I need to communicate better. Let's have a meeting and figure out who can take on what tasks.

Paulina: Sounds good. Clear communication will ensure everyone knows what they're responsible for.

Displayed text:

Consequences (displayed at the end of this option scene) Clear communication ensures that tasks are delegated effectively, minimizing misunderstandings and delays. Sarah's colleagues feel valued and empowered, leading to increased motivation and productivity within the team.

Provide ongoing support and feedback to delegated tasks.

Spoken text:

Sarah: I'll make sure to check in regularly with everyone who's helping out. Offering support and feedback will keep things on track.

Paulina: That's thoughtful of you, Sarah. It'll help us all work more effectively as a team.

Displayed text:

Consequences (displayed at the end of this option scene) Sarah's ongoing support and feedback help her colleagues to perform at their best. As a result, tasks are completed with greater efficiency and accuracy. The success of the project reflects positively on Sarah's leadership skills, enhancing her reputation within the team and organization.

Decision tree:

- Day 1: Meeting International Students
 - Option 1: Individual Support > Suboptions 1.1, 1.2, 1.3.
 - Option 2: Group Sessions > Suboptions 2.1, 2.2, 2.3.
 - Option 3: Cultural Mentoring Program.
 - Option 4: Withdrawal (drop out).
- Day 2: Emilio's Problem
 - Option 1: Dialog sessions.
 - Option 2: Team-building activities.
 - Option 3: Peer mediation.
- Day 3: Event Organization
 - Option 1: Task delegation.
 - Option 2: Full control.
 - Option 3: Collaboration with one team member.
 - Option 4: Task prioritization.
 - Option 5: Simplification of the event format.
- Day 4: Conflict between John and Paul
 - Option 1: Neutrality and moderation of dialogue.
 - Option 2: Bias.
 - Option 3: Ignoring the conflict.
- Day 5: Final Challenge
 - Option 1: Overworking.
 - Option 2: Stress management (breaks, mindfulness techniques).
 - Option 3: Delegating tasks.

The adopted method for implementing scenario number 2 in VR

Due to the implementation and the requirements of the Client, the scenario is described in English in the following sections of the document.

Title of the scenario: "Leadership Scenario 2"

Example props divided by locations (All rooms should have elements indicating that the location is within a university building. These elements should be in English and not indicate a specific university.):

- International Relations Office:
 - Conference table with chairs;
 - Whiteboard with markers;
 - Notebooks, pens;
 - Computers, laptops, projector.
- Individual meetings between Sarah and international students:
 - Desk and chair for a student;
 - Meeting calendar;
 - Documents related to students.
- Group study sessions:
 - Chairs arranged in a circle;
 - Flipchart or whiteboard;
 - Materiały naukowe, podręczniki.
- Spotkanie dotyczące programu mentoringu kulturowego:
 - Sala spotkań z dużym stołem;
 - Broszury informacyjne o programie;
 - Recruitment cards for mentors.

Character descriptions:

- Sarah:
 - Leader of the International Relations Office, experienced, supportive, determined to empower her team.
 - Outfit: formal, business, modern.
- Colleague 1:
 - Senior employee, engaged in professional development, eager to learn new intercultural communication strategies.



- Outfit: casual, neat.

Colleague 2:

- Creative, supportive colleague, interested in enhancing teamwork and innovation.

- Outfit: elegant, casual.

Colleague 3:

- Experienced employee, values recognition and appreciation for hard work, focused on providing psychological support to students.

- Outfit: formal, elegant.

International Students:

- Students from different countries facing various challenges related to adapting to a new academic and cultural environment.

- Outfit: casual, student-style.

Sample descriptions of rooms:

International Relations Office:

- A modern office with a collaborative workspace and bright lighting.

- A large conference table in the center of the room, with a task board on the wall.

Sarah's meeting room:

- A cozy office with a desk and two chairs, featuring posters on the walls that promote cultural diversity.

Common area:

- A spacious, bright room with comfortable chairs arranged in a circle, allowing for interaction among students.

A meeting room for the mentoring program:

- A large table surrounded by chairs, a whiteboard on the wall, and a projector for presentations.

Division into dialogues and variants:

Day 2

Scene 1: Staff Meeting

Displayed text:

Sarah strides into the International Relations Office, greeted by the hum of activity as her

colleagues prepare for the day ahead.

Spoken text:

Colleague 1: Good morning, Sarah. Ready to tackle another day of challenges?

Sarah: Absolutely. But first, let's gather everyone for our weekly staff meeting.

Recording comment: Sarah gathers her team around the table, ready to discuss strategies and address any emerging issues.

Scene 2: Addressing Staff Concerns

Spoken text:

Sarah: (Addressing the team) Good morning, everyone. Before we dive into today's agenda, I want to open the floor for any concerns or updates from each of you.

Colleague 2: (Raising hand) Sarah, I've noticed an increase in the number of inquiries from international students regarding mental health support. It seems like the transition to a new country is taking a toll on their well-being.

Sarah: Thank you for bringing that up. It's crucial that we prioritize the mental health and well-being of our students. Let's brainstorm ways we can enhance our support services in this area.

Colleague 3: (Nodding) I agree. Perhaps we could organize workshops or seminars on coping strategies for cultural adjustment and stress management.

Sarah: That's a great idea. Let's explore potential partnerships with counseling services on campus to provide additional resources for our students.

Scene 3: Empowering the Team

Recording comment: Sarah turns to her team, her expression determined yet encouraging.

Spoken text:

Sarah: I'm confident that together, we can address these challenges and continue to provide exceptional support to our international students. Each of you plays a vital role in ensuring their success and well-being.

Colleague 4: (Smiling) Thanks, Sarah. It's reassuring to know that we're all working towards the same goal.

Sarah: Absolutely. Let's leverage our strengths, collaborate effectively, and stay proactive in our approach. Together, we can make a real difference in the lives of our students.

Displayed text:

What should Sarah do to empower her team? Here are three possible approaches she can take:



Option 1: Training and Development

Spoken text:

Sarah: We'll invest in training and development opportunities for our staff to enhance their skills in supporting international students.

Colleague 1: (Enthusiastically) That sounds fantastic. I've been wanting to learn more about cross-cultural communication strategies.

Sarah: I'll coordinate with HR to organize workshops and seminars tailored to our team's needs.

Displayed text:

Consequences: Investing in staff training and development enhances the team's capacity to provide effective support to international students; Staff members feel valued and empowered, leading to increased morale and job satisfaction; The office cultivates a culture of continuous learning and professional growth, positioning them as leaders in international student support.

Option 2: Team Collaboration

Spoken text:

Sarah: Let's foster a culture of collaboration where everyone's ideas and input are valued.

Colleague 2: (Eagerly) I love that idea. We have such a diverse team with unique perspectives to contribute.

Sarah: I'll schedule regular brainstorming sessions where we can collectively problem-solve and innovate.

Displayed text:

Consequences:

Promoting team collaboration fosters creativity and innovation, leading to the development of more effective support strategies; Staff members feel engaged and motivated, resulting in increased productivity and job satisfaction; The office cultivates a supportive and inclusive work environment, strengthening team cohesion and morale.

Option 3: Recognition and Appreciation

Spoken text:

Sarah: Let's make a conscious effort to recognize and appreciate each other's contributions.

Colleague 3: (Smiling) It would be nice to feel acknowledged for the hard work we do.

Sarah: I'll implement a system for peer-to-peer recognition and celebrate milestones and achievements as a team.

Displayed text:

Consequences:

Recognizing and appreciating staff contributions boosts morale and motivation, leading to higher job satisfaction and retention rates; Staff members feel valued and respected, fostering a positive work culture and enhancing team cohesion; The office becomes known for its supportive and collaborative environment, attracting top talent and enhancing its reputation in the university community.

Option 1: Individualized Support

Scene: International Relations Office, Sarah's Office

Displayed text:

Sarah sits at her desk, reviewing her schedule for the day. As she looks over the agenda, she notices several appointments marked for one-on-one meetings with international students. With a warm smile, she prepares herself for the day ahead, knowing that each meeting presents an opportunity to make a difference in the lives of these students.

In her first meeting, Sarah welcomes a student who expresses frustration with adapting to the new cultural environment. With empathy in her voice, Sarah listens intently as the student shares their challenges. She reassures them that their feelings are valid and offers practical advice on navigating cultural differences.

In another meeting, Sarah meets with a student struggling to keep up with coursework due to unfamiliar teaching styles. Taking a collaborative approach, Sarah works with the student to develop strategies for academic success, including seeking out additional resources and communicating with professors.

Throughout the day, Sarah meets with several more students, each with their own unique concerns and struggles. With patience and understanding, she provides individualized support, addressing each student's needs with care and attention.

At the end of the day, Sarah reflects on the conversations she's had and the progress made. Despite the challenges, she feels grateful for the opportunity to support these students on their journey and looks forward to continuing to make a difference in their lives.

Option 2: Group Study Session

Scene: International Relations Office, Common Area

Displayed text:

Sarah gathers a group of international students in the common area of the office, arranging chairs in a circle to facilitate discussion. As the students settle in, Sarah begins the session by inviting each student to share their experiences and challenges.

As the discussion unfolds, Sarah encourages students to share tips and strategies for academic success, fostering a sense of collaboration and camaraderie. Students ex-

change ideas, offer support, and bond over shared experiences, creating a supportive and inclusive environment.

Throughout the session, Sarah facilitates the conversation, ensuring that each student has the opportunity to participate and contribute. She offers guidance and encouragement, steering the discussion towards productive outcomes.

As the session comes to a close, Sarah thanks the students for their participation and encourages them to continue supporting each other outside of the group. With a sense of pride, she watches as the students leave the office, knowing that they've formed connections that will help them succeed in their academic journey.

Option 3: Cultural Mentoring Program

Scene: International Relations Office, Meeting Room

Displayed text:

Sarah meets with university stakeholders to discuss the implementation of a cultural mentoring program. Together, they brainstorm ideas for recruiting mentors and matching them with mentees, ensuring that each pair is well-suited to support one another.

After the meeting, Sarah reaches out to potential mentors, inviting them to participate in the program. She provides training and resources to help them effectively support their mentees, emphasizing the importance of empathy, cultural sensitivity, and active listening.

As the program launches, Sarah oversees the matching process, carefully pairing mentors and mentees based on shared interests and backgrounds. She checks in regularly with participants, ensuring that the relationships are progressing smoothly and addressing any issues that arise.

As the program gains momentum, Sarah witnesses the positive impact it has on both mentors and mentees. International students feel supported and empowered, while domestic students gain valuable leadership and communication skills. With a sense of satisfaction, Sarah knows that the program will continue to foster cross-cultural understanding and support student success for years to come.

Decision tree:

- Empower the Team:
 - Option 1: Training and Development
 - Organizing workshops and seminars > Increasing team competencies.
 - Option 2: Team Collaboration
 - Regular brainstorming sessions > Increased innovation and collaboration.
 - Option 3: Recognition and Appreciation

- Recognition and appreciation system > Increased morale and team cohesion.

- Individualized Support:

- Individual meetings with students > More effective support and student satisfaction.

- Group Study Session:

- Group sessions > Increased student engagement and sense of community.

- Cultural Mentoring Program:

- Implementation of a cultural mentoring program > Better support for international students and skill development for local student leaders.

Accepted method of implementing scenario number 3 in VR

Due to implementation and the client's requirements, the scenario is described in English in the following sections of the document.

Title of the scenario: "Leadership Scenario"

Example props categorized by locations (All rooms should have elements indicating that the location is within a university building. These elements should be in English and not refer to any specific university):

- Office for International Relations:

- Conference table with chairs;
- Whiteboard with markers;
- Notebooks, pens;
- Computers, laptops, projector.

- Morning team meeting:

- Conference table, chairs;
- Materials related to daily planning, meeting agenda.

- Meeting with an international student:

- Desk, chairs;
- Informational materials on psychological and legal support.

- Workshops and training sessions:

- Workshop room with a projector;
- Training materials on diversity and social inclusion;

-



- Support resources for students:
 - Informational brochures about support services;
 - Contact forms for support groups and counseling.

Character Descriptions:

- Sarah:
 - Leader of the International Relations Office, charismatic, empathetic, determined to advocate for diversity and inclusion.
 - Outfit: formal, business, elegant.
- Colleague 1:
 - Trusted team member, supporting the leader, engaged in the daily challenges of the office.
 - Attire: casual, neat.
- Colleague 2:
 - Employee with great enthusiasm for working on behalf of international students, believes in the importance of empathy and understanding.
 - Attire: casual, modern.
- International Student:
 - International student experiencing difficulties due to discrimination on campus, emotional and seeking support.
 - Attire: casual, student.
- Trainer:
 - Role: Person conducting intercultural communication training.
 - Traits: Competent, experienced in intercultural communication, skillfully conducts training, able to engage participants and provide practical tools.
 - Attire: Professional, formal.
 - Description: The trainer is responsible for delivering a training session aimed at enhancing the competencies of the International Relations Office team in intercultural communication. During the training, the trainer discusses strategies for effective communication with international students and ways to address challenges arising from cultural differences. They are an expert who helps the team understand and overcome their own cultural biases, with the goal of improving the quality of support offered to international students.

Sample descriptions of rooms:

- I** International Relations Office:
 - I** A modern office with space for teamwork and bright lighting.
 - I** A large conference table in the center of the room, with a task board on the wall.
- I** Sarah's Meeting Room:
 - I** A cozy office with a desk and two chairs, featuring posters promoting cultural diversity on the walls.
- I** Workshop Room:
 - I** A spacious room with a projector, chairs arranged in a circle, and training materials on the tables.

Division into dialogues and variants:

Day 3

Scene 1: Leadership Introduction

Spoken text:

Sarah: (Entering the International Relations Office with a confident demeanor) Good morning, Team! Another day to make a positive impact in our international community.

Colleague 1: Good morning, Sarah. Ready to lead the way?

Sarah: Absolutely. Let's review today's agenda and see how we can enhance our support for our international students and foster cross-cultural understanding.

Scene 2: Empowering Team and Leading by Example

Displayed text:

Sarah gathers the team for a morning briefing, emphasizing the importance of proactive leadership and empathy in their interactions with international students.

Spoken text:

Sarah: (Addressing the team with warmth) Team, I want to remind us all of the crucial role we play in supporting our international students. As leaders in the International Relations Office, it's imperative that we approach each interaction with empathy, understanding, and a commitment to fostering inclusivity.

Colleague 2: (Enthusiastically) Absolutely, Sarah. Our students rely on us for guidance and support, especially during challenging times.

Sarah: (Nodding) Precisely. Let's keep that in mind as we go about our day. Now, let's discuss any potential challenges or opportunities we foresee and how we can best address them together.



Scene 3: Handling a Sensitive Situation

Displayed text:

Sarah is approached by a distressed international student who is experiencing discrimination on campus.

Spoken text:

International Student: (Emotionally) Sarah, I don't know what to do. I've been experiencing discrimination from some of my peers, and it's making it hard for me to focus on my studies.

Sarah: (Expressing concern) I'm sorry to hear that you're going through this. Please know that you're not alone, and we take matters like this very seriously.

Recording comment: Sarah takes immediate action, initiating a confidential investigation into the incident and providing the student with resources for support and advocacy.

Sarah: (Reassuring) We will do everything in our power to ensure that you feel safe and supported on our campus. Your well-being is our top priority.

Displayed text:

What should Sarah do to lead effectively in this situation? Here are three possible approaches he can take:

Option 1: Implementing Diversity and Inclusion Workshops

Spoken text:

Sarah: We will organize workshops and training sessions on diversity, inclusion, and cultural sensitivity for both students and staff.

International Student: (Relieved) That sounds like a step in the right direction. It's important to educate everyone about these issues.

Sarah: Agreed. I'll work with our team to develop a comprehensive program and ensure that it addresses the needs of our diverse community.

Displayed text:

Consequences: The workshops foster a culture of respect and understanding on campus, leading to increased awareness of cultural differences and a reduction in discriminatory behavior; Students and staff feel empowered to speak out against discrimination and actively contribute to a more inclusive environment.

Option 2: Establishing a Student Support Task Force

Spoken text:

Sarah: We will create a task force comprised of students, faculty, and staff to address issues related to student well-being and inclusivity.

International Student: (Impressed) That's a proactive approach. It's reassuring to know that our concerns are being taken seriously.

Sarah: Absolutely. I believe that involving the entire community in problem-solving will lead to more effective solutions and a stronger sense of unity.

Displayed text:

Consequences: The task force facilitates open dialogue and collaboration among stakeholders, resulting in the implementation of targeted initiatives to support international students and promote inclusivity; Students feel empowered to actively participate in decision-making processes and advocate for their needs.

Option 3: Strengthening Support Services

Spoken text:

Sarah: We will enhance our support services for international students, including counseling, mentorship, and legal assistance.

International Student: (Grateful) That would make a huge difference. Knowing that there are resources available to help us navigate challenges is reassuring.

Sarah: Absolutely. Our goal is to ensure that every student feels supported and equipped to succeed during their time with us.

Displayed text:

Consequences: The expanded support services provide students with access to the resources they need to address a wide range of issues, including discrimination, mental health concerns, and academic challenges; International students feel valued and supported by the university, leading to increased retention rates and overall satisfaction with their educational experience.

Option 4: Ignoring the Issue

Spoken text:

Sarah: Well, these things happen. I'm sure it'll blow over soon enough.

International Student: (Disheartened) But I don't feel safe on campus anymore. I need help.

Sarah: (Dismissively) I'm sure it's not as bad as you think. Just try to focus on your studies and ignore the negativity.

Displayed text:

Consequences: The student feels unsupported and marginalized by Sarah's lack of action, leading to increased feelings of isolation and vulnerability; The university's reputation suffers as word spreads about its inadequate response to discrimination, potentially resulting in decreased enrollment and negative publicity.



Decision tree:

- | Handling a Sensitive Situation:
 - | Option 1: Implementing Diversity and Inclusion Workshops:
 - | Organization of workshops and training > Increasing awareness of diversity, reducing cases of discrimination.
 - | Option 2: Establishing a Student Support Task Force:
 - | Establishment of a task force > Better support for students, engagement of the academic community.
 - | Option 3: Strengthening Support Services:
 - | Expansion of support services > Greater sense of safety and support among students.
 - | Option 4: Ignoring the Issue:
 - | Lack of response > Deterioration of the situation for students, negative effects on the university's reputation.

Adopted method for implementing scenario number 4 in VR

Due to the implementation and requirements of the Client, the scenario is described in English in the following sections of the document.

Title of the scenario: "Leadership Scenario 3"

Sample props divided by locations (all rooms should have elements indicating that the location is within a university building. These elements should be in English and not indicate a specific university):

- | International Relations Office:
 - | Conference table with chairs;
 - | Whiteboard with markers;
 - | Notebooks, pens;
 - | Computers, laptops, projector.
- | Morning team meeting:
 - | Conference table, chairs;
 - | Materials for day planning, meeting agenda.
- | Meeting with university administration:
 - | Presentations, informational materials;

- ┆ Notebooks, laptops for presentations.
- ┆ Preparations for the cultural exchange event:
 - ┆ Promotional posters;
 - ┆ Logistics materials (task lists, schedules).
- ┆ Intercultural communication training:
 - ┆ Training room with projector;
 - ┆ Training materials on intercultural communication;
 - ┆ Flipchart and markers.

Character descriptions:

- ┆ Sarah:
 - ┆ Leader of the International Relations Office, effective, strategic, focused on team development and supporting students.
 - ┆ Attire: formal, business, elegant.
- ┆ Colleague 1:
 - ┆ Detail-oriented team member, responsible for office operations.
 - ┆ Attire: casual, neat.
- ┆ Colleague 2:
 - ┆ Employee with great enthusiasm for teamwork, believes in the importance of collaboration.
 - ┆ Attire: casual, modern.
- ┆ Colleague 3:
 - ┆ Responsible for visa matters, experienced in handling international documentation.
 - ┆ Attire: smart casual.
- ┆ Colleague 4:
 - ┆ Team member responsible for liaising with university administration, focused on partnership strategies.
 - ┆ Attire: formal, business.
- ┆ Colleague 5:
 - ┆ Event promotion and logistics specialist, creative, organized.
 - ┆ Attire: casual, modern.



Sample descriptions of rooms:

I International Relations Office:

- I** A modern office with space for teamwork and bright lighting.
- I** A large conference table in the center of the room, with a task board on the wall.

I Training Room:

- I** A spacious room with a projector, chairs arranged in a circle, and training materials on the tables.

Division into dialogues and variants:

Day 4

Scene 1: Introduction

Spoken text:

Sarah: (Entering the International Relations Office with a confident smile) Good morning, Team!

Colleague 1: Morning, Sarah. Ready to tackle today's challenges?

Sarah: Absolutely. Let's dive in and see how we can make a difference today.

Scene 2: Managing Office Operations

Displayed text:

Sarah gathers her team for a quick morning briefing to discuss the day's tasks and priorities.

Spoken text:

Sarah: (Addressing the team) Good morning, everyone. Today, we have several important tasks on our agenda. First, we need to follow up on pending visa applications for incoming international students. Second, we have a meeting with the university administration to discuss potential collaborations with partner institutions abroad. And third, we need to finalize preparations for the upcoming cultural exchange event next week.

Colleague 2: It sounds like a busy day ahead. How do you suggest we prioritize these tasks?

Sarah: (Strategically) Let's start by addressing the urgent matters first, such as the visa applications, to ensure that our incoming students have a smooth transition. Then, we can allocate time for the administrative meeting to explore new opportunities for international partnerships. Finally, we'll dedicate the remainder of our day to refining the details of the cultural exchange event to ensure its success.

Displayed text:

What should Sarah do to effectively manage the office and lead her team? Here are three possible approaches she can take:

Option 1: Delegating Responsibilities

Spoken text:

Sarah: We'll divide the tasks among ourselves based on each team member's strengths and expertise. Colleague 3, can you follow up on the visa applications and ensure all necessary documentation is in order? Colleague 4, please prepare the agenda and any relevant materials for our meeting with the university administration. And Colleague 5, let's work together to finalize the logistics and promotion plan for the cultural exchange event.

Displayed text:

Consequences: Delegating responsibilities allows Sarah to leverage her team's skills and expertise effectively, maximizing productivity and efficiency; Team members feel empowered and valued when entrusted with specific tasks, fostering a sense of ownership and accountability; Sarah maintains a clear oversight of all activities and can provide support and guidance as needed, ensuring that each task is completed successfully.

Option 2: Team Collaboration

Spoken text:

Sarah: Let's approach today's tasks as a collaborative effort. We'll brainstorm ideas together, share updates and insights, and support each other every step of the way. By working as a cohesive team, we can achieve our goals more efficiently and effectively.

Displayed text:

Consequences: Encouraging team collaboration fosters a supportive and inclusive work environment where ideas are freely exchanged and collective problem-solving is encouraged; Team members feel motivated and engaged when working together towards a common goal, leading to increased productivity and job satisfaction; Sarah strengthens her leadership skills by facilitating teamwork and nurturing a positive office culture, earning the trust and respect of her colleagues.

Option 3: Professional Development

Spoken text:

Sarah: Let's take some time today to invest in our professional development. We'll schedule a brief training session to enhance our knowledge and skills in areas relevant to our work, such as intercultural communication or international student support services. By continuously improving ourselves, we can better serve the needs of our diverse student population and stay ahead in our field.



Co-funded by
the European Union

Akademia WSB
WSB University



businet^B
global business education network

avans
university
of applied sciences

Displayed text:

Consequences: Prioritizing professional development demonstrates Sarah's commitment to excellence and continuous learning, inspiring her team to strive for growth and self-improvement; Team members gain valuable insights and tools that they can apply to their daily tasks, enhancing their effectiveness and job satisfaction; Sarah fosters a culture of innovation and adaptability within the office, positioning her team for long-term success in a rapidly changing global landscape.

Delving deeper into each of the tasks Sarah and her team are undertaking and explore the scenarios further.

Option 1: Delegating Responsibilities

Scenario: Follow-up on Visa Applications

Displayed text:

Colleague 3, tasked with following up on visa applications, encounters a complication with a student's documentation.

Spoken text:

Colleague 3: (Concerned) Sarah, I've run into an issue with one of the visa applications. The student's financial documents seem to be incomplete, and we're having trouble verifying their funds.

Sarah: (Supportive) Let's review the documents together and see what we can do to resolve this. Can you reach out to the student and request any missing information or clarification?

Colleague 3: (Relieved) Yes, I'll contact the student immediately and guide them through the process. Hopefully, we can sort out the documentation before it causes any delays.

Displayed text:

Consequences: By addressing the issue promptly and providing guidance to the student, Sarah and her team ensure that the visa application process proceeds smoothly, minimizing potential delays for the student.

Colleague 3 gains experience in handling complex situations and develops problem-solving skills under Sarah's guidance, enhancing their professional development.

Sarah demonstrates effective leadership by offering support and solutions, reinforcing her team's confidence in her leadership and fostering a collaborative work environment.

Option 2: Team Collaboration

Scenario: Brainstorming Ideas for International Partnerships

Displayed text:

Sarah and her team gather around a conference table to brainstorm potential collaborations with partner institutions abroad.

Spoken text:

Sarah: (Facilitating the discussion) Let's explore different avenues for international partnerships. What are some key areas or regions we should focus on?

Colleague 4: (Eagerly) I think we should prioritize partnerships with universities in emerging markets, such as Southeast Asia or Latin America. There's a lot of potential for cultural exchange and academic collaboration in those regions.

Colleague 5: (Building on the idea) We could also look into joint research initiatives or student exchange programs to foster deeper connections with our partner institutions.

Sarah: (Encouraging) Those are excellent suggestions. Let's create a list of potential partners and assess their compatibility with our goals and values. We can then reach out to them to explore opportunities for collaboration further.

Displayed text:

Consequences: Through collaborative brainstorming, Sarah and her team generate innovative ideas and strategies for expanding the university's international partnerships, tapping into new markets and opportunities for growth.

Team members feel empowered and engaged when their input is valued and incorporated into decision-making processes, fostering a sense of ownership and commitment to the shared goals.

Sarah demonstrates her leadership skills by facilitating productive discussions and encouraging creativity, strengthening the bonds within her team and enhancing their collective problem-solving capabilities.

Option 3: Professional Development

Scenario: Intercultural Communication Training

Displayed text:

Sarah organizes a training session on intercultural communication for her team to enhance their skills in supporting international students.

Spoken text:

Trainer: (Leading the session) Today, we'll explore strategies for effective intercultural communication and discuss common challenges faced by international students. Let's start by reflecting on our own cultural biases and how they may influence our interactions with students from diverse backgrounds.

Sarah: (Engaged) It's essential for us to be mindful of our cultural assumptions and to approach each interaction with sensitivity and empathy. By understanding the cultural context of our students, we can better support their academic and personal success.

Colleague 2: (Sharing insights) I've noticed that language barriers can sometimes hinder communication with international students. Are there specific techniques we can use to overcome this challenge?



Co-funded by the European Union

Akademia WSB
WSB University



Trainer: (Providing guidance) Absolutely. We'll explore strategies such as active listening, using visual aids, and simplifying language to ensure clear and effective communication, regardless of language proficiency.

Displayed text:

Consequences: The intercultural communication training equips Sarah and her team with practical skills and tools to navigate cultural differences and support international students more effectively, enhancing the quality of their services.

Team members gain a deeper understanding of the importance of cultural sensitivity and empathy in their interactions with diverse student populations, fostering a more inclusive and welcoming environment.

Sarah demonstrates her commitment to professional development and continuous learning, setting a positive example for her team and reinforcing a culture of excellence within the office.

Decision tree:

- I Managing Office Operations:
 - I Option 1: Delegating Responsibilities
 - I Task allocation according to competencies > Increased efficiency, need for supervision.
 - I Option 2: Team Collaboration:
 - I Joint planning and brainstorming > Increase in motivation and innovation, need for strong leadership.
 - I Option 3: Professional Development:
 - I Team training > Development of competencies, better support for students, need for time investment.

Adopted method for implementing scenario number 5 in VR

Scenario Task 1 in VR Space (Connecting a Computer to the Ethernet Network)

Objective: As an office manager responsible for IT processes, the participant's task is to restore network functionality in the office by configuring the Ethernet connection and setting the IP address on one of the staff computers, allowing the team to continue working.

Task Scenario Description:

Briefing: You start the day with a report from the team that one of the key computers in

the office has lost network connection. Your task is to quickly diagnose and resolve the issue to avoid disrupting office work.

Identifying and Diagnosing the Problem: You first need to locate the problematic computer; to do this, analyze the network diagram highlighting the computer and its location. Then, use the diagnostic computer to confirm the issue.

Connecting the Ethernet Cable:

The course participant goes to the office room where the malfunctioning computer is located. It turns out the problem is due to the Ethernet cable not being connected. The participant then finds the Ethernet outlet on the wall and selects an Ethernet cable from three available options used for connecting network infrastructure and computer equipment. They proceed to choose the appropriate port for connection on the computer panel. This action requires approaching the computer and selecting the correct port through interaction using VR controllers.

Configuring the IP Address: Now that the physical connection has been restored, you open the network configuration panel on the computer. Using the interactive VR keyboard, you enter the correct settings for the IP address, subnet mask, and default gateway according to the information in the network diagram document.

Testing and Completing the Task: After configuration, you check the connection using the ping command to the company server (as per the network diagram). Upon receiving a positive result, you report the completion of the task to the team, who can now continue working. Your effective management and problem-solving skills are crucial for the smooth operation of the office.

VR Scene Description

Environment: A realistic, modern office furnished with computers, printers, and other office equipment. The walls are adorned with subtle corporate graphics.

Interactive Objects:

- **Ethernet Cable:** A realistically modeled cable that needs to be picked up and connected to the appropriate ports on the computer and the wall.
- **Network Outlets:** Outlets located on the wall and on the computer panel. **Office Computer:** A standard office computer with a visible Ethernet port. The computer screen serves as an interface for entering network settings.
- **Network configuration panel:** It appears on the computer screen after the Ethernet cable is connected. It includes options for configuring the IP address, subnet mask, and default gateway. The panel also allows for running network diagnostic commands.



Co-funded by
the European Union

Akademia WSB
WSB University



Special Effects:

- Audio Interactions: Each successful interaction, such as connecting the cable or entering the correct settings, is confirmed with a satisfying sound or signal.

Scenario Task 2 in VR Space (Diagnosing and Connecting the Printer)

Objective: As the person managing the office operations, you are tasked with diagnosing and resolving the issue with a printer that is not printing. Your tasks include correctly connecting the printer to the computer using a USB cable and replenishing the paper.

Task Description:

Mission Start: You start in the office with a report from the team that important documents cannot be printed on time due to unknown issues with the printer. Your task is to intervene quickly.

Diagnosing the Problem: The first step is to go to the office room with the malfunctioning printer. It turns out that the printer is not connected. You need to choose the appropriate connection cable from three available options. To do this, you should examine the ports on both the printer and the computer, and select the correct ports and the appropriate cable.

Resolving the Paper Issue: After connecting the printer to the computer, a message about a paper shortage appears on the printer's screen. You need to open the printer tray and replenish the stack of paper. The paper is located on a nearby shelf, and positioning it requires the use of VR controllers.

Testing the Printer: After resolving both issues, you go to the computer to test the printer by selecting the option to print a test page. Successfully printing the test page confirms that the printer is now fully operational.

Completing the Task: After successfully completing the mission, you report the task's completion to the team, who can now continue working on important documents. Your effectiveness and quick action have been appreciated by the entire team.

VR Scene Description

Environment: A spacious, well-lit office with various workstations, including computers and printers.

Interactive Objects:

- USB Cable: A physically realistic USB cable that the player must pick up and connect to the appropriate ports on the printer and computer.
- Printer: A modern office printer with a clearly marked USB port and a paper tray.
- Stack of Paper: A stack of white paper for the printer that the player must precisely place in the printer tray.
- Computer: An office computer with a screen where the option to print a test page

can be selected to test the printer.

Special Effects:

- Audio Interactions: Sounds of connecting the USB cable, replenishing paper, and initiating printing add realism to the task.

Scenario Task 3 in VR Space (Setting Up a Simple AdHoc Network Using a WiFi Interface)

Objective: As the person overseeing the proper functioning of computer equipment, your task is to set up a simple AdHoc network using a WiFi interface for two laptops, utilizing the appropriate device. You need to choose between a wireless router, a switch, and a hardware firewall, then correctly connect the selected device and configure the IP addresses on both laptops.

Task Description:

Choosing the Device: You begin in a room with available devices: a wireless router, a switch, and a hardware firewall. Your first task is to select the device that will work best for setting up the AdHoc network. The correct answer is the wireless router.

Connecting the Router: After selecting the router, you need to find the appropriate port on the device and connect the network cable to the outlet in the wall. This task also requires choosing the correct connection cable from the three used for networking connections.

Analyzing the Network Diagram: Next, you receive a network diagram that you must analyze to understand how to configure the IP addresses for the two laptops so that they can communicate in the AdHoc network.

Configuring IP Addresses: You proceed to configure the laptops. On each laptop, you open the network settings and manually configure the IP addresses according to the network diagram. This task requires an understanding of the basics of network configuration and IP addressing.

Testing the Connection: After configuring the IP addresses, you test the connection between the laptops by checking if they can “ping” each other. Successful tests confirm that the AdHoc network is functioning correctly.

Completing the Task: After successfully setting up and testing the network, you receive a notification of task completion. Your skills and knowledge allowed for a quick and effective establishment of the AdHoc network.

VR Scene Description

Environment: A technical room with a desk featuring various networking devices (wireless router, switch, hardware firewall) and two laptops. The walls are neutral, adorned with several network diagrams for decoration. On the desk, there are connection cables (one of which needs to be used for the exercise). A sheet of paper with the network dia-



Co-funded by
the European Union

Akademia WSB
WSB University



businet^B
global business education network

avans
university
of applied sciences

gram is placed on the desk.

Interactive Objects:

- Networking Devices: Wireless router, switch, hardware firewall—each with clearly marked ports and sockets.
- Network Cable: A physically realistic cable that needs to be connected appropriately.
- Laptops: Two interactive laptops on which the player must configure the network settings.
- Network Diagram: A virtual document containing the information necessary for proper network configuration.

Special Effects:

- Visual Hints: Elements that are currently relevant to the task gently pulse to draw the player’s attention.
- Sounds: Realistic sound effects for connecting cables and typing on the computer keyboard enhance immersion.

Scope of Tests for Scenario 1

Test Case Set for “Scenario 1” of the VR4SKILL Application:

1. Functional tests

Test Case 1: Verification of the scenario’s functionality

- Objective: To check whether each scenario operates according to the design specifications.
- Steps:
 - Launch the VR4SKILL application.
 - Select one of the available scenarios.
 - Go through the entire scenario, performing all interactions.
 - Complete the scenario and verify whether the intended outcome was achieved.
- Expected Outcome: The scenario should operate without errors, all interactions should be accessible, and the scenario should conclude as intended.

Test Case 2: User Path Tests

- Objective: To verify the functionality of all possible user paths in the scenario.
- Steps:
 - Launch the VR4SKILL application.
 - Select one of the available scenarios.

- | Navigate through different paths of the scenario, making various choices and interactions.
- | Complete the scenario for each possible path.
- | Expected Outcome: Each path should function correctly, leading to the appropriate conclusion of the scenario.

2. Performance Tests

Test Case 3: Performance Smoothness Test

- | Objective: To verify that the application operates smoothly without any stutters or interruptions.
- | Steps:
 - | Run the VR4SKILL application on the target VR hardware.
 - | Select the scenario with the highest graphical load.
 - | Go through the scenario, paying attention to the frames per second (FPS).
- | Expected outcome: The application should run smoothly, maintaining a stable FPS above 70.

Test scenario 4: Resource optimization test

- | Objective: Evaluate the consumption of system resources while the application is running.
- | Steps:
 - | Launch the VR4SKILL application on the target VR hardware.
 - | Monitor CPU, RAM, and GPU usage during the scenario.
 - | Record the results.
- | Expected outcome: Resource usage should be at an acceptable level, without causing performance drops.

3. Usability Testing

Test Scenario 5: Evaluation of Interface Intuitiveness

- | Objective: To check whether the user interface is intuitive and easy to use.
- | Steps:
 - | Invite several users to test the application.
 - | Ask them to go through the scenario without prior training.
 - | Gather their feedback on the interface and ease of use.
- | Expected outcome: Users should be able to use the application without significant



difficulties, and the interface should be considered intuitive.

Test scenario 6: Immersion and realism test

- Objective: Assessment of the level of immersion and realism in VR scenarios.
- Steps:
 - Conduct a test involving end users.
 - Ask them to assess the level of immersion while using the application.
 - Gather feedback on the realism of the VR environment.
- Expected outcome: Users should feel immersed in the VR world, and the scenarios should be considered realistic.

4. Stability and security testing

Test Scenario 7: Long-term Stability Testing

- Objective: Check the stability of the application during prolonged use.
- Steps:
 - Launch the VR4SKILL application and select one of the more complex scenarios.
 - Keep the application running for several hours while regularly navigating through the scenario.
 - Record any stability issues, such as crashes, freezes, or memory leaks.
- Expected outcome: The application should run stably for an extended period without noticeable issues.

Test Scenario 8: User Safety Assessment

- Objective: Checking whether the application does not induce simulator sickness or other health issues.
- Steps:
 - Ask a group of users to test the application for a specified period.
 - Gather their feedback on physical comfort while using VR.
 - Record any instances of discomfort, such as nausea, dizziness, or eye strain.
- Expected Outcome: Users should report minimal or no symptoms of discomfort, and the application should be considered safe to use.

5. Accessibility Testing

Test Scenario 9: Accessibility Testing for Individuals with Mobility Limitations

- Objective: Check whether the application is accessible for individuals with mobility limitations.

- | Steps:
 - | Launch the VR4SKILL application with participants who have mobility limitations.
 - | Navigate through the scenario, assessing the ability to interact without the need for full mobility.
 - | Collect feedback on how well the application accommodates their needs.
- | Expected Outcome: The application should be accessible to individuals with mobility limitations, providing appropriate interaction options.

Test Scenario 10: Accessibility Testing for Individuals with Visual and Hearing Impairments

- | Objective: Assessment of the application's accessibility for individuals with visual and hearing impairments.
- | Steps:
 - | Launch the VR4SKILL application with participants who have visual and hearing impairments.
 - | Check if the content is properly adapted (e.g., contrast, subtitles).
 - | Collect feedback on how well the application meets their needs.
- | Expected outcome: The application should be accessible to individuals with visual and hearing impairments, providing appropriate support and accessibility features.
- | The result should be correct for both English and Polish signature tests.

6. Regression testing

Test scenario 11: Regression testing after introducing new features

- | Objective: Check if the new changes have introduced errors in existing features.
- | Steps:
 - | After introducing updates or new features, launch the VR4SKILL application.
 - | Go through the previously functioning scenarios.
 - | Record any new errors or issues.
- | Expected outcome: All scenarios should function without issues, and new features should not negatively impact existing functionality.

Scope of testing for scenario number 2 in VR

Test scenario set for "Scenario 2" of the VR4SKILL application:

1. Functional tests

Test scenario 1: Verification of scenario functionality



Objective: Check whether each scenario operates according to the design specifications.

Steps:

- Launch the VR4SKILL application.
- Select one of the available scenarios.
- Go through the entire scenario, performing all interactions.
- Complete the scenario and verify whether the intended outcome has been achieved.

Expected result: The scenario should run without errors, all interactions should be available, and they should lead to the conclusion of the scenario as intended.

Test scenario 2: User path testing

Objective: Verification of the functionality of all possible user paths in the scenario.

Steps:

- Launch the VR4SKILL application.
- Select one of the available scenarios.
- Navigate through different paths of the scenario, making various choices and interactions.
- Complete the scenario for each possible path.

Expected outcome: Each path should function correctly, leading to the appropriate conclusion of the scenario.

2. Performance testing

Test Scenario 3: Smoothness Performance Test

Objective: Verify that the application runs smoothly without any stutters.

Steps:

- Launch the VR4SKILL application on the target VR hardware.
- Select the scenario with the highest graphic load.
- Go through the scenario, paying attention to the frames per second (FPS).

Expected result: The application should run smoothly, maintaining a stable FPS above 70.

Test scenario 4: Resource optimization test

Objective: Evaluation of system resource consumption during the application's operation.

Steps:

- | Launch the VR4SKILL application on the target VR hardware.
- | Monitor CPU, RAM, and GPU usage during the scenario.
- | Record the results.
- | Expected outcome: Resource usage should be at an acceptable level, not causing any performance drops.

3. Usability testing

Test scenario 5: Evaluation of the interface's intuitiveness

- | Objective: Checking whether the user interface is intuitive and easy to use.
- | Steps:
 - | Invite several users to test the application.
 - | Ask them to go through the scenario without prior training.
 - | Gather their feedback on the interface and ease of use.
- | Expected outcome: Users should be able to use the application without significant difficulties, and the interface should be considered intuitive.

Test scenario 6: Immersion and realism test

- | Objective: Assessment of the level of immersion and realism in VR scenarios.
- | Steps:
 - | Conduct a test with end users.
 - | Ask them to evaluate the level of immersion while using the application.
 - | Collect feedback on the realism of the VR environment.
- | Expected outcome: Users should feel immersed in the VR world, and the scenarios should be considered realistic.

4. Stability and Safety Testing

Test Scenario 7: Long-term Stability Testing

- | Objective: Check the stability of the application during prolonged use.
- | Steps:
 - | Launch the VR4SKILL application and select one of the more complex scenarios.
 - | Keep the application running for several hours, regularly progressing through the scenario.
 - | Record any stability issues, such as crashes, freezes, or memory leaks.
- | Expected result: The application should run stably for an extended period without noticeable problems.



Test scenario 8: User safety assessment

- Objective: Check whether the application does not cause simulation sickness or other health issues.
- Steps:
 - Ask a group of users to test the application for a specified period.
 - Gather their feedback on physical comfort while using VR.
 - Record any instances of discomfort, such as nausea, dizziness, or eye strain.
- Expected outcome: Users should report minimal or no symptoms of discomfort, and the application should be considered safe for use.

5. Accessibility Testing

Test Scenario 9: Accessibility Testing for Individuals with Mobility Limitations

- Objective: Check whether the application is accessible for individuals with mobility limitations.
- Steps:
 - Launch the VR4SKILL application with users who have mobility limitations.
 - Go through the scenario, assessing the ability to interact without the need for full mobility.
 - Collect feedback on how well the application meets their needs.
- Expected outcome: The application should allow individuals with mobility limitations to use it, offering appropriate interaction options.

Test Scenario 10: Accessibility Testing for Individuals with Visual and Hearing Impairments

- Objective: Assessment of the application's accessibility for individuals with visual and hearing impairments.
- Steps:
 - Run the VR4SKILL application with users who have visual and hearing impairments.
 - Check if the content is appropriately adapted (e.g., contrast, subtitles).
 - Gather feedback on how well the application meets their needs.
- Expected result: The application should be accessible to individuals with visual and hearing impairments, providing appropriate support and accessibility features.
- The result should be accurate for both English and Polish language tests.

6. Regression Testing

Test Scenario 11: Regression Testing After Introducing New Features

- | Objective: Checking whether the new changes have introduced any errors in existing functions.
- | Steps:
 - | After implementing updates or new features, launch the VR4SKILL application.
 - | Go through the previously functioning scenarios.
 - | Record any new errors or issues.
- | Expected result: All scenarios should operate smoothly, and new features should not negatively impact existing functionality.

Scope of Testing for Scenario No. 3 in VR

Test Scenario Set for "Scenario 3" of the VR4SKILL Application:

1. Functional Testing

Test Scenario 1: Verification of Scenario Functionality

- | Objective: Verification that each scenario operates according to the design specifications.
- | Steps:
 - | Launch the VR4SKILL application.
 - | Select one of the available scenarios.
 - | Go through the entire scenario, performing all interactions.
 - | Complete the scenario and verify whether the intended result has been achieved.
- | Expected outcome: The scenario should function without errors, all interactions should be accessible, and lead to the completion of the scenario as intended.

Test scenario 2: User path tests

- | Objective: Verification of the functionality of all possible user paths in the scenario.
- | Steps:
 - | Launch the VR4SKILL application.
 - | Select one of the available scenarios.
 - | Navigate through different paths of the scenario, making various choices and interactions.
 - | Complete the scenario for each possible path.



- | Expected outcome: Each path should function correctly, leading to the appropriate conclusion of the scenario.

2. Performance tests

Test scenario 3: Smoothness performance test

- | Objective: Checking whether the application runs smoothly without any lag.
- | Steps:
 - | Launch the VR4SKILL application on the target VR hardware.
 - | Select the scenario with the highest graphical load.
 - | Navigate through the scenario, paying attention to the frames per second (FPS).
- | Expected outcome: The application should run smoothly, maintaining a stable FPS above 70.

Test scenario 4: Resource optimization test

- | Objective: Assessment of system resource consumption while the application is running.
- | Steps:
 - | Launch the VR4SKILL application on the target VR hardware.
 - | Monitor CPU, RAM, and GPU usage during the scenario.
 - | Record the results.
- | Expected outcome: Resource consumption should be at an acceptable level, not causing any performance drops.

3. Usability Testing

Test scenario 5: Evaluation of interface intuitiveness

- | Objective: Checking whether the user interface is intuitive and easy to use.
- | Steps:
 - | Invite several users to test the application.
 - | Ask them to navigate through the scenario without prior training.
 - | Collect their feedback on the interface and ease of use.
- | Expected outcome: Users should be able to use the application without significant difficulties, and the interface should be considered intuitive.

Test scenario 6: Immersion and realism test

- | Objective: Assessment of the level of immersion and realism in VR scenarios.

- | Steps:
 - | Conduct a test involving end users.
 - | Ask them to assess the level of immersion while using the application.
 - | Collect feedback on the realism of the VR environment.
- | Expected outcome: Users should feel immersed in the VR world, and the scenarios should be considered realistic.

4. Stability and security tests

Test scenario 7: Long-term stability tests

- | Objectivel: Checking the stability of the application during prolonged use.
- | Steps:
 - | Launch the VR4SKILL application and select one of the more complex scenarios.
 - | Leave the application running for several hours, regularly navigating through the scenario.
 - | Record any stability issues, such as crashes, freezes, or memory leaks.
- | Expected outcome: The application should run stably for an extended period without noticeable problems.

Test scenario 8: User safety assessment

- | Objectivel: Checking whether the application does not cause motion sickness or other health issues.
- | Steps:
 - | Ask a group of users to test the application for a specified period.
 - | Collect their feedback on physical comfort while using VR.
 - | Record any instances of discomfort, such as nausea, dizziness, or eye strain.
- | Expected outcome: Users should report minimal or no discomfort symptoms, and the application should be deemed safe for use.

5. Accessibility Testing

Test Scenario 9: Accessibility Testing for Individuals with Mobility Limitations

- | Objective: To check if the application is accessible for individuals with mobility limitations.
- | Steps:
 - | Launch the VR4SKILL application with participants who have mobility limitations.
 - | Navigate through the scenario, assessing the ability to interact without requir-



ing full mobility.

- Gather feedback on how well the application accommodates their needs.

- Expected Outcome: The application should enable use by individuals with mobility limitations, offering appropriate interaction options.

Test Scenario 10: Accessibility Testing for Individuals with Visual and Hearing Impairments

- Objective: To assess the application’s accessibility for individuals with visual and hearing impairments.

Steps:

- Launch the VR4SKILL application with participants who have visual and hearing impairments.
- Check if the content is appropriately adapted (e.g., contrast, subtitles).
- Gather feedback on how well the application accommodates their needs.

- Expected Outcome: The application should be accessible to individuals with visual and hearing impairments, offering appropriate support and accessibility features.

- The results should be accurate for subtitle testing in both English and Polish.

6. Regression Testing

Test Scenario 11: Regression Testing After Introducing New Features

- Objective: To verify that new changes have not introduced errors in existing functionalities.

Steps:

- After implementing updates or new features, launch the VR4SKILL application.
- Go through previously functioning scenarios.
- Record any new bugs or issues.

- Expected Outcome: All scenarios should function smoothly, and the new features should not negatively impact existing functionality.

Scope of Testing for Scenario 4 in VR

Test Suite for “Scenario 4” of the VR4SKILL Application:

1. Functional Testing

Test Scenario 1: Verification of Scenario Functionality

- Objective: To check if each scenario operates according to design specifications.

Steps:

- | Launch the VR4SKILL application.
 - | Select one of the available scenarios.
 - | Go through the entire scenario, performing all interactions.
 - | Complete the scenario and verify if the intended outcome has been achieved.
- | Expected Outcome: The scenario should function without errors, all interactions should be accessible, and the scenario should conclude as intended.

Test Scenario 2: User Path Testing

- | Objective: To verify the functionality of all possible user paths within the scenario.
- | Steps:
 - | Launch the VR4SKILL application.
 - | Select one of the available scenarios.
 - | Navigate through different paths in the scenario, making various choices and interactions.
 - | Complete the scenario for each possible path.
- | Expected Outcome: Each path should function correctly, leading to the appropriate conclusion of the scenario.

2. Performance Testing

Test Scenario 3: Smooth Operation Test

- | Objective: To verify that the application runs smoothly without any lag.
- | Steps:
 - | Launch the VR4SKILL application on the target VR hardware.
 - | Select the scenario with the highest graphical load.
 - | Navigate through the scenario, paying attention to the frames per second (FPS).
- | Expected Outcome: The application should run smoothly, maintaining a stable FPS above 70.

Test Scenario 4: Resource Optimization Test

- | Objective: To assess the consumption of system resources while the application is running.
- | Steps:
 - | Launch the VR4SKILL application on the target VR hardware.
 - | Monitor CPU, RAM, and GPU usage during the scenario.



- Record the results.

- Expected Outcome: Resource consumption should be at an acceptable level, not causing any performance drops.

3. Usability Testing

Test Scenario 5: Evaluation of Interface Intuitiveness

- Objective: To check if the user interface is intuitive and easy to use.

Steps:

- Invite several users to test the application.
- Ask them to navigate through the scenario without prior training.
- Collect their feedback on the interface and ease of use.

- Expected Outcome: Users should be able to use the application without significant difficulties, and the interface should be considered intuitive.

Test Scenario 6: Immersion and Realism Test

- Objective: To assess the level of immersion and realism in the VR scenarios.

Steps:

- Conduct a test with end users.
- Ask them to evaluate their level of immersion while using the application.
- Collect feedback on the realism of the VR environment.

- Expected Outcome: Users should feel immersed in the VR world, and the scenarios should be regarded as realistic.

4. Stability and Security Testing

Test Scenario 7: Long-Term Stability Testing

- Objective: To check the stability of the application during prolonged use.

Steps:

- Launch the VR4SKILL application and select one of the more complex scenarios.
- Leave the application running for several hours, regularly navigating through the scenario.
- Record any stability issues, such as crashes, freezes, or memory leaks.

- Expected Outcome: The application should operate stably for an extended period without noticeable issues.

Test Scenario 8: User Safety Assessment

- Objective: To check if the application does not induce simulation sickness or other

health issues.

- | Steps:
 - | Ask a group of users to test the application for a specified period.
 - | Collect their feedback on physical comfort while using VR.
 - | Record any instances of discomfort, such as nausea, dizziness, or eye strain.
- | Expected Outcome: Users should report minimal or no discomfort symptoms, and the application should be deemed safe for use.

5. Accessibility Testing

Test Scenario 9: Accessibility Testing for Individuals with Mobility Limitations

- | Objective: To check if the application is accessible for individuals with mobility limitations.
- | Steps:
 - | Launch the VR4SKILL application with participants who have mobility limitations.
 - | Navigate through the scenario, assessing the ability to interact without requiring full mobility.
 - | Gather feedback on how well the application accommodates their needs.
- | Expected Outcome: The application should enable use by individuals with mobility limitations, offering appropriate interaction options.

Test Scenario 10: Accessibility Testing for Individuals with Visual and Hearing Impairments

- | Objective: To assess the application's accessibility for individuals with visual and hearing impairments.
- | Steps:
 - | Launch the VR4SKILL application with participants who have visual and hearing impairments.
 - | Check if the content is appropriately adapted (e.g., contrast, subtitles).
 - | Gather feedback on how well the application accommodates their needs.
- | Expected Outcome: The application should be accessible to individuals with visual and hearing impairments, offering appropriate support and accessibility features.
- | The results should be accurate for subtitle testing in both English and Polish.

6. Regression Testing

Test Scenario 11: Regression Testing After Introducing New Features

- | Objective: To verify that new changes have not introduced errors in existing func-



Co-funded by
the European Union

Akademia WSB
WSB University



functionalities.

- I Steps:
 - I After implementing updates or new features, launch the VR4SKILL application.
 - I Navigate through previously functioning scenarios.
 - I Record any new bugs or issues.
- I Expected Outcome: All scenarios should function smoothly, and the new features should not negatively impact existing functionality.

Scope of Testing for Scenario 5 in VR

Test Suite for “Scenario 5” of the VR4SKILL Application:

1. Functional Testing

Test Scenario 1: Verification of Scenario Functionality

- I Objective: To check if each scenario operates according to design specifications.
- I Steps:
 - I Launch the VR4SKILL application.
 - I Select one of the available scenarios.
 - I Navigate through the entire scenario, performing all interactions.
 - I Complete the scenario and verify if the intended outcome has been achieved.
- I Expected Outcome: The scenario should function without errors, all interactions should be accessible, and the scenario should conclude as intended.

Test Scenario 2: User Path Testing

- I Objective: To verify the functionality of all possible user paths within the scenario.
- I Steps:
 - I Launch the VR4SKILL application.
 - I Select one of the available scenarios.
 - I Navigate through different paths in the scenario, making various choices and interactions.
 - I Complete the scenario for each possible path.
- I Expected Outcome: Each path should function correctly, leading to the appropriate conclusion of the scenario.

2. Performance Testing

Test Scenario 3: Smooth Operation Test

- | Objective: To verify that the application runs smoothly without any lag.
- | Steps:
 - | Launch the VR4SKILL application on the target VR hardware.
 - | Select the scenario with the highest graphical load.
 - | Navigate through the scenario, paying attention to the frames per second (FPS).
- | Expected Outcome: The application should run smoothly, maintaining a stable FPS above 70.

Test Scenario 4: Resource Optimization Test

- | Objective: To assess the consumption of system resources while the application is running.
- | Steps:
 - | Launch the VR4SKILL application on the target VR hardware.
 - | Monitor CPU, RAM, and GPU usage during the scenario.
 - | Record the results.
- | Expected Outcome: Resource consumption should be at an acceptable level, not causing any performance drops.

3. Usability Testing

Test Scenario 5: Evaluation of Interface Intuitiveness

- | Objective: To check if the user interface is intuitive and easy to use.
- | Steps:
 - | Invite several users to test the application.
 - | Ask them to navigate through the scenario without prior training.
 - | Collect their feedback on the interface and ease of use.
- | Expected Outcome: Users should be able to use the application without significant difficulties, and the interface should be considered intuitive.

Test Scenario 6: Immersion and Realism Test

- | Objective: To assess the level of immersion and realism in the VR scenarios.
- | Steps:
 - | Conduct a test with end users.
 - | Ask them to evaluate their level of immersion while using the application.
 - | Collect feedback on the realism of the VR environment.



- | Expected Outcome: Users should feel immersed in the VR world, and the scenarios should be regarded as realistic.

4. Stability and Security Testing

Test Scenario 7: Long-Term Stability Testing

- | Objective: To check the stability of the application during prolonged use.
- | Steps:
 - | Launch the VR4SKILL application and select one of the more complex scenarios.
 - | Leave the application running for several hours, regularly navigating through the scenario.
 - | Record any stability issues, such as crashes, freezes, or memory leaks.
- | Expected Outcome: The application should operate stably for an extended period without noticeable issues.

Test Scenario 8: User Safety Assessment

- | Objective: To check if the application does not induce simulation sickness or other health issues.
- | Steps:
 - | Ask a group of users to test the application for a specified period.
 - | Collect their feedback on physical comfort while using VR.
 - | Record any instances of discomfort, such as nausea, dizziness, or eye strain.
- | Expected Outcome: Users should report minimal or no discomfort symptoms, and the application should be deemed safe for use.

5. Accessibility Testing

Test Scenario 9: Accessibility Testing for Individuals with Mobility Limitations

- | Objective: To check if the application is accessible for individuals with mobility limitations.
- | Steps:
 - | Launch the VR4SKILL application with participants who have mobility limitations.
 - | Navigate through the scenario, assessing the ability to interact without requiring full mobility.
 - | Gather feedback on how well the application accommodates their needs.
- | Expected Outcome: The application should enable use by individuals with mobility limitations, offering appropriate interaction options.

Test Scenario 10: Accessibility Testing for Individuals with Visual and Hearing Impairments

- | Objective: To assess the application's accessibility for individuals with visual and hearing impairments.
- | Steps:
 - | Launch the VR4SKILL application with participants who have visual and hearing impairments.
 - | Check if the content is appropriately adapted (e.g., contrast, subtitles).
 - | Gather feedback on how well the application accommodates their needs.
- | Expected Outcome: The application should be accessible to individuals with visual and hearing impairments, offering appropriate support and accessibility features.
- | The results should be accurate for subtitle testing in both English and Polish.

6. Regression Testing

Test Scenario 11: Regression Testing After Introducing New Features

- | Objective: To verify that new changes have not introduced errors in existing functionalities.
- | Steps:
 - | After implementing updates or new features, launch the VR4SKILL application.
 - | Navigate through previously functioning scenarios.
 - | Record any new bugs or issues.
- | Expected Outcome: All scenarios should function smoothly, and the new features should not negatively impact existing functionality.



VR4 Skills

VR4 Skills



Co-funded by
the European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author or authors only and do not necessarily reflect those of the European Union or the Foundation for the Development of the Education System. Neither the European Union nor the entity providing the grant can be held responsible for them

Akademia WSB
WSB University

