

IO1 Report: Needs Analysis and Environment Design & Description

Aims of IO1

The first intellectual output in this project was to define and describe the 10 environments that will be developed in the following IOs on VR training environments by and for people with Autism Spectrum Disorders (ASD). According to the general aim of the AutismVR project to provide people with ASD with a sustainable and effective training opportunity in virtual reality for social interactions, especially in the context of job search and everyday work, the following subtasks for IO1 arise:

- Needs analysis of everyday environments and situations that are particularly difficult and challenging for people with ASD
- Selection of the 10 most needed and logical transnational training environments (taking into account the needs assessment, the aim to foster the employment of people with ASD, the transnational transferability and the technical feasibility)
- Description of the 10 environments, including the learning objectives, characters, interactions and the levels and obstacles (tasks to be solved) within the environments
- Description of the teacher/trainer interface and possible changes within the environments (lower/higher difficulty by reducing/increasing the "disturbing factors" within the respective environment)
- Description of the log system for monitoring the possible improvements of the users

Implementation of IO1

The implementation of this IO was led by the German partner Wisamar and carried out by all project partners. Wisamar developed the necessary templates and instructions in close cooperation with the lead of IO2, Vifin, to ensure the easy and direct further development of the results.

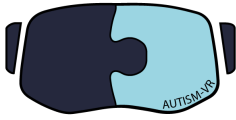
The tasks of this IO were implemented in four steps:

1. Needs analysis in all partner countries

In all partner countries, 10 semi-structured interviews were conducted with people who are affected by ASD, with their relatives and/or with professionals working with autists. The prepared interview guidelines (see annex) helped the interviewers to collect information about environments and situations which represent special challenges in everyday life of people with ASD. The interviews were possible face to face as well as on the phone or by mail. This was to give those affected in particular the opportunity to choose the most comfortable way for them, because the interview itself was a great challenge for them. The documentation of the interviews was results-oriented, i.e. each project partner extracted the relevant information from the national interviews using a common template.

keyword	Where are we?	Who's acting in this situation?	What's going on?/What is to be done?	Which are the challenging points for autists in this situation/environment?
Short keyword to name the situation/environment, like "buy a ticket", "small talk about weather"...	Description of the environment	Description of co-environment people	Description of interactions within the environments	Description of possible problems/obstacles/barriers from the perspective of people with ASD

Template for interview results



IO1 Report: Needs Analysis and Environment Design & Description

2. Selection of the 10 training environments

The synthesis of the interview results and the selection of the final 10 VR training environments took place in three stages. First, each partner compressed the interview results into a national summary, which was then merged into a transnational synthesis. In the third step, this synthesis was discussed by the partners and formed the basis for the selection of the 10 most needed and logical transnational training environments to be developed in this project.

3. Description of the 10 training environments

The partners divided the selected 10 environments among themselves, so that each partner described two of them in detail. Vifin as lead of IO2 provided a template to ensure that all relevant information was provided and considered in the first step of the description for the further technical implementation (see annex). The descriptions include the following points:

- Overall learning objective of this environment
- Storyline (What will happen from the beginning to the end?)
- Environment itself (Where are we?) with pictures
- Characters within the environment (Who does the user interact with? Are there any extra people?)
- Quests (What small tasks does the user perform?)
- Game objects (Are there any special objects the user needs to finish a quest?)
- Teacher/trainer overview: possible distractions

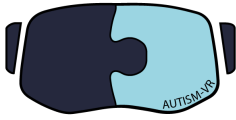
The descriptions were each reviewed and discussed by all other partners in the peer review to ensure that the environments are designed to be as transnational as possible.

4. Description of the trainer's interface and the log system

Parallel to the description of the content of the future platform, first considerations on the implementation of the teacher/trainer interface and the log system took place. They will be designed depending on the environments that will ultimately be developed. Basically, the teacher/trainer interface should enable a teacher/trainer (if available) to actively influence the unfolding scene by allowing him/her to introduce disturbing elements along the path as well as to activate supporting processes, such as verbal or graphic reminders to cope with a situation. The log system should monitor the time spent by the user, the number of disturbances, natural and activated, the number of calls for help, etc.

The complete implementation of IO1 was accompanied and supported by the continuous communication of the project partners on the online platform Slack, during the Kick Off Meeting and the – due to COVID19 online held – second transnational partner meeting (24.+25.3.2020) as well as during three further online meetings at the end of April, beginning and end of June 2020.

Of course IO1, the Needs Analysis and Environment Design & Description, was also evaluated. LHBF, the responsible project partner, collected relevant data both for the presentation and discussion of the upcoming work process during the kick off meeting and for the presentation and discussion of the interview results and the joint decision of all project partners on the 10 selected training environments during the second (virtual) partner meeting. The results of the evaluation can be found in the corresponding report on IO4 "Evaluation and Assessment".



IO1 Report: Needs Analysis and Environment Design & Description

Results of IO1

Conducting the interviews for the needs ASDessment was sometimes difficult because the interview situation as such is very challenging for people with ASD. However, these interviews particularly helped the project team to understand the individual perspective and the difficulties in seemingly simple everyday situations. It was also shown that especially the interviews with people who are professionally involved with autism were productive in identifying difficult everyday situations for autistic people, as the professionals were able to abstract and summarize more easily.

In all partner countries it was possible to conduct interviews with autistic people and with people who are very close to them. In the transnational synthesis of the interview results the following situations arose, which people with autism experience as particularly challenging:

- **Public transport** – complete procedure from purchasing a ticket to getting off at the right place. But there are very big differences between the partners' countries and the way the transport system works
- **Doctor's appointment** – calling, setting up the appointment and visiting the doctor
- **Lunch break** in the school or company - eating in the canteen (school or company), quick decision making at a buffet, conversation at the table
- **Grocery shopping** – sensory overload, decision making, interactions with staff/strangers
- **Orientation on the street** –finding the right way, asking a stranger for help/directions
- **Cinema/Theatre** – buying tickets, waiting in line, people (strangers) sitting around and how to enjoy the show

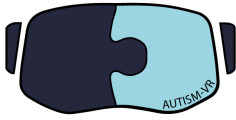
A lot of interviewees highlighted further situations but these are not really environments in the sense of this project but important aspects which should be taken into consideration for the development:

- **Social interactions** – challenging to interpret unspoken signals and to react promptly; greetings, small talk (unspoken rules of small talk; game of questions), dealing with irony, sarcasm, metaphors
- **At the phone** – uncertainty about who is on the phone and what she/he wants
- **Social situations at work** – first meeting, dealing with criticism, own honesty, bullying
- How to overcome **changes** (teachers/colleagues, rooms, food etc.)
- **Emergency** – unclear situations, what to do

Many of these social situations, which were mentioned as challenging by the respondents, are very commonplace, such as greetings or small talk in different constellations, so that they can be integrated into the VR environments that are being developed. Some aspects (dealing with criticism, bullying, etc.) are explicitly addressed in IO3.

A further result of the interviews was the fact and insight that ASD persons find it difficult to put themselves in "as-if" situations. For this reason it is important that the VR environments of the project are as close to reality as possible. However, this is a particular problem where the national context or background for an environment is very different, such as public transport in the different partner countries. Therefore the partnership decided to implement the most frequently mentioned public transport environment in a special





IO1 Report: Needs Analysis and Environment Design & Description

way: Five individual environments will be developed for the five partner regions involved. This will make it much easier for future users, people with ASD, to transfer the VR experience into their real life.

So the environments 1 to 5, which will be further developed in the project, are

1. Denmark - [Train journey](#) (Vifin)
2. The United Kingdom - [Tube in London](#) (LBHF)
3. France - [Bus in the city](#) (Pistes Solidaires)
4. Germany - [Tram in the city](#) (Wisamar)
5. Cyprus - [Bus trip](#) (Synthesis)

The partners have agreed that their respective public transport environment is successfully completed when the user departs by transport. The quests are basically similar for all of them, each adapted to the regional conditions: buy a ticket and - if necessary - validate it, find out the departure time, find the right departure point, enter the means of transport, etc.

For the other 5 environments that will be developed in the project, the project partnership decided on the one hand to take up the results of the needs analysis and on the other hand to put the special focus on the working world. The latter corresponds to the main objective of the project, which is to help people with ASDs to find their way into a job, to orientate themselves in everyday working life, to adapt to a new environment and to facilitate dealing with changes in everyday life.

So the environments 6 to 10, which will be further developed in the project, are ...

6. [Doctor's Appointment](#) (Wisamar)

The purpose of this environment is to allow the user to experience a visit to the doctor, during which s/he must answer and respond to various questions or requests depending on the symptoms. The first step is for the user to make an appointment with the doctor's office by telephone. Then the user is in the doctor's office, has to register with the receptionist, follow her instructions and takes a seat in the waiting room. The third step in this environment concerns the examination itself: The user meets the doctor and must answer questions. The scenario ends at the point where the physical examination would begin.

This environment will be more feasible with the 3D environment in order to allow the user the greatest possible interactivity.

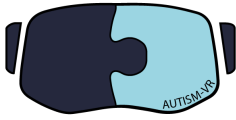
7. [Lunch break at workplace](#) (Synthesis)

In this environment the user will take a lunch break with his/her colleagues. S/he has brought her/his lunch from home, wants to heat it up in the common kitchen in the microwave and then eats together with colleagues in a common room. Here, on the one hand, arrangements have to be made (Is the microwave free for use?), on the other hand, small talk has to be made during lunch. As a special difficulty in this environment, a spontaneous, surprising birthday party for a colleague is built in, where social customs (congratulate someone, sing a song together) have to be followed and it gets much louder in the room.

This environment will be developed in 3D to allow maximum interaction.

8. [At the supermarket](#) (LBHF)





IO1 Report: Needs Analysis and Environment Design & Description

In this environment, the aim is for users to gain confidence in their behaviour in the supermarket. They are asked to search for the appropriate goods according to a given shopping list and put them in their shopping basket, to find their way around the supermarket (despite a lot of products on the shelves and noises around them), to ask for help, to react to questions from others if necessary, to queue and pay at the checkout, etc.

This environment will also be developed in 3D.

9. A job interview (Vifin)

The purpose of this environment is to let the user experience a job-interview situation in which s/he is being interviewed and must respond to the questions asked. The scenario is designed through a combination of a recent jobindex.dk app (also developed by psychologists) where people can practice a job interview, but adapted with recommendations for autists that have to participate in a job interview.

Behind the scenes, the Interview is divided into several categories: approximately 40-50 questions will be developed and grouped (as well as ASDigned a level) inside the categories below and can be randomized, so that the user can go through the interview again with new questions as well as at different levels.

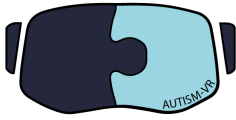
This environment will be done in the 360° video format for a realistic feeling in the interview situation towards "real" people.

10. First day at work (Pistes Solidaires)

The theme of this environment is the first day in a new job. Here the users can train to find their way in a new, unknown environment and to deal with unpredictable situations. This environment will be divided into three steps. Each one can be considered as a level of progression with some familiar situations in the workplace. The first level is the beginning of the first day at the new office: meeting with the director, presentation of the new colleagues, and ASDignation of a desk. In the second level, the user would be in front of the photocopier but there will be a jammed paper in the machine. S/he will need to call a colleague who knows the machine to open it and unblock it. In the last level, the user will be asked by the director for a meeting, at the end of the first day without knowing why. This scenario will also be developed in a 3D environment.

When designing the environments, an attempt was made to integrate as many of the social aspects mentioned as challenging by the respondents as possible into the environments (greetings, small talk, telephone calls, first meetings, behaviour in groups ...). Thus, greetings of different kinds will occur in almost all environments. In the lunch break with colleagues, during the job interview and also on the first working day, the user will meet different people, sometimes for the first time, and will have to orientate and behave in a group. In these environments, small talk will of course also be practiced. A telephone call will be necessary to make an appointment for a visit to the doctor. These are just a few examples and possibilities how social challenges of everyday life are taken up and implemented in the training environments.

All environments were read, completed and, if necessary, corrected by all partners in order to enable the greatest possible proximity to everyday life and adaptability for people with ASD in all partner countries.



ANNEX

Interview Guidelines

Interview with an ASD expert

We are part of the European project “Social Inclusion of People With Autism Spectrum Syndrome Through Virtual Reality”, funded by Erasmus+. This project intends to develop virtual reality training tools that through simulated everyday situations will train and enhance the social skills of adults with ASD and improve their ability to navigate standard situations.

The VR-learning environments offer a simulated reality where people with ASD can enter and ‘practice’ an everyday situation. By using the VR technology, the project creates a learning environment that is immersive, realistic and responsive, but pleasant, safe and non-threatening for the user. The idea is to generate training scenarios that will increase the target group’s ability to navigate standard everyday situations.

For this, we kindly ask you for your support. You know best which situations are a (daily) challenge for people with ASD. We would like to ask you to share your knowledge and experience with us by answering the following questions. Your information will serve as a basis for us to develop the virtual training environments in our project.

We would be very grateful if you could describe **at least 3 environments** which, based on your experience, represent special challenges in the everyday life of people with ASD. Of course, you are also welcome to describe further situations using the questions.

Some personal information:

- c You yourself are affected by Autism Spectrum Syndrome.
- c You are related to or close to a person with ASD. Who is affected by ASD?:

_____ 

- c You are working with or for people with ASD. Please briefly describe what you're doing:

_____ 

I agree to be contacted by the project team for any queries or further information regarding my descriptions.

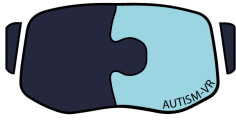
Name:

E-Mail / Phone number:

This information will only be used to contact you for this survey and will not be shared.

Starting question for interviewees affected by Autism Spectrum Syndrome:





What's the hardest part of your day?

Starting question for interviewees who are relatives of people with ASD:

From your point of view, what's the hardest part of his/her day?

Which situations and which actions do people with autism experience as a special challenge in their (everyday) lives? Please describe the respective situations/environments by answering the following questions.

Where are we?

(Description of the environment)

Who's acting in this situation?

(Description of in-environment people)

What's going on?/What is to be done?

(Description of interactions within the environments)

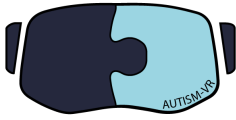
Which are the challenging points for autists in this situation/environment?

(Description of possible problems/obstacles/barriers from the perspective of people with ASD)

Please answer these questions for three different situations/environments.

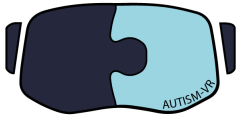
Thank you very much for your support!





Template for environment description

Environment Title & Responsible Partner:
Overall Learning objective: what is the purpose of this scenario
Storyline: what will happen from the beginning to the end:
Environment: where are we? Any picture suggestions? (all partners must provide video/photo)
Characters: from storyline- Who do you interact with? Are there any extra people? Do they have specific clothing? Their gender, race and age?
Quests: what small tasks does the player perform? <ul style="list-style-type: none">● Go there● Take this● Do this
Game objects: are there any special objects the player needs to finish a quest?
Dialogues



IO1 Report: Needs Analysis and Environment Design & Description

Teacher/trainer overview: distractions

(for example: Increase the amount of people in the shop ...)

Additional Comments: