

4 Personas and Scenarios

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4.1 Introduction

The POSEIDON-project is obliged to a user-centred approach. It aims to develop the new assisting technology (POSEIDON) in joint collaboration with the potential users and their carers. In every stage of the product development users and their helpers are interviewed, monitored etc.

Before the concrete work with users and carers will start, a common understanding of the target group has to be gained within the group of scientist working on the development of POSEIDON. In this stage of the developmental process a clear understanding of the target group and the situations in which POSEIDON may be helpful has to be developed. The focus will be on a common understanding of the living situation of the possible users and carers and their daily life problems in which an assisting technology as POSEIDON could be helpful.

The first step is to create personas and scenarios. This is a common technique to reach such an understanding by creating a realistic simulation of people having problems in their everyday life and showing possible solutions for these problems.

Personas are designed to identify and understand the target group, to gain information about possible users of a product. Fictive persons are created based on relevant socio-demographic data like name, gender, age, economic situation, living conditions and other information which could be valuable regarding the final product. In the end, personas are supposed to represent different members of the typical target group.

The aim is to involve all of the team in using the personas for a better understanding of the users' needs and problems. It is also a cohesive element for the team building.

Scenarios are designed to identify and broaden the understanding of when, why and how technological supply could be helpful. Scenarios are stories, including a setting and actors to show possible use cases and tasks for the developed product. They try to be close to reality and represent everyday life situations of the target group. It is a demonstration, how the product can be used to solve everyday problems. In best case, as experienced showed, that this is more effective, scenarios are built on personas.

Literature

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4.2 Procedure: Creating personas and scenarios

Each participating country has provided at least two personas and two scenarios. The personas cover the following target groups:

- male and female persons within the ages 15 to 32
- persons living in supported living or persons living in family home
- persons with different conditions associated with Down's syndrome
- persons going to school or work
- persons with a different attitude towards technology and different experiences with technology

The scenarios include:

- the need for assistive technology offering help in time-management, money management, transportation, information processing, learning and taking care of health
- the need for assistive technology supporting independence while facilitating socializing

The responsibilities for these tasks were as follows:

Country	Partner
Germany	Arbeitskreis Down-Syndrom EV
UK	DOWN'S SYNDROME ASSOCIATION LBG
Norway	NORSK NETTVERK FOR DOWN SYNDROME FORENING

4.3 Overview: Personas and scenarios

The table below gives an overview of the main information of the personas acting in the scenarios, which were created for the POSEIDON project and are shown in the following chapter. The table enables the reader to see at a glance: gender, age and specifications, including the persona's cognitive condition and the everyday situations where help is needed.

Name (country)	Gender, age	Specifications
Sajid Stevens (UK)	Male, 32	Living in supported living home. Moderate learning disability. Poor visual acuity Very active. Uses technology, needs help with new apps.
Rachel Patterson (UK)	Female, 23	Living with her mother. Poor visual acuity. Poor hearing. Problems with fine motor skills. Works. Uses PC.
Jennifer (UK)	Female, 19	Living with her parents. Moderate learning disability. Visiting college. Problems in managing time and money. Uses PC
Elisabeth Hansen (Norway)	Female, 15	Living with her parents. Mental age lower than physical. Goes to school. Very social. Struggles with time. Uses PC, Ipad etc.
Jerik Ottersen (Norway)	Male, 25	Living in supported living home. Mental age lower than physical. Very independent. Gets help from Assistive Technology. Struggles with concentration. Uses every kind of technology.
Nico Musterling	Male, 15	Living with his parents. Learning by observing. Going to school.
Karin Mustermann	Female, 17	Has a Mobile-Phone for emergency and plays WII. Living with parents. Learning disability. Integrated in normal school system. Owns a Smartphone, uses keyboard, mini computer and plays „Sing-Star“

Persona



Sajid Stevens, UK

General information	Condition	Technology
<p>Age: 32</p> <p>Gender: Male</p> <p>Family/support: Mother, Father, no siblings.</p> <p>Living conditions: Lives in supported living with two other men in their 20s-30s with learning disabilities.</p> <p>Hobbies/Interests: Sajid enjoys comedies, socialising, watching cricket and football, going to the gym with his support worker on Tuesdays and Fridays and his job.</p> <p>Attitude/Feelings: Sajid is a well-liked, confident person and he enjoys life. He sometimes gets frustrated when he can't do things or if someone asks him to do something he doesn't want to do. He is quite good at avoiding doing what he needs to do, especially at work.</p>	<p>Cognitive: Moderate learning disability</p> <p>Sensory: Poor visual acuity – needs to wear glasses.</p> <p>Motor:</p> <p>Body: Overweight. Has difficulties making healthy eating choices.</p> <p>Everyday Life</p> <p>Skills: Sajid can cook with some supervision and assistance. He enjoys reading but isn't so good at writing.</p> <p>Limitations: Sajid has trouble making healthy choices and understanding long term consequences. He also needs prompts to remember things.</p>	<p>Technology use: Sajid is already quite confident with technology. Sajid got an iPad last Christmas and with the help of his support worker and parents he is now able to use it more independently, although he sometimes needs help.</p> <p>Attitude towards technology: Sajid likes using the internet and his iPad, though he doesn't like it when things go wrong and panics when he sees 'error' messages. He finds the screen on iPhones too small.</p> <p>Sajid will not need too much sustained support to help him use technology. However, he does need help with unfamiliar apps and programmes, so he will need to be shown several times how to use his apps, and to be reminded by his support worker to make use of his tablet each day.</p>

Scenario

Sajid Stevens, UK

User type: Person with Down's syndrome living in supported living, needs technology alongside external support to help him live more independently.

Actors: Sajid (32), his mother Aalia (67) and his father Thomas (65). Support workers.

Help needed with: weight, information processing, time management

Sajid lives in a shared house in supported living with three other male friends with mild to moderate learning disabilities in South East London. He moved into supported living five years ago and enjoys being independent and living with friends. He has a support worker who visits his flat three times a day: in the mornings to help him get ready for work or daily activities, in the evenings to help him and his housemates cook meals, and at night to remind them all to go to bed.

Sajid has visual timetables in his shared flat and his support worker always prompts him about what he needs to do each day. He has visual step by step guides in his house to help him remember how and when to do things, but these aren't portable and Sajid finds it harder to remember outside his home. Sajid needs to be prompted to do the things that he does each day, such as eating healthily,

Sajid works for three hours from 13.00 – 16.00 on Wednesdays and four hours from 11.00 – 15.00 on Thursdays in a supermarket a five minute walk away from his house. His job involves sorting items in the stock room, helping stack shelves and transporting stock. He enjoys the job but sometimes has trouble remembering everything his manager has asked him to do. If his manager gives him a list of several instructions, he will do the first and then go and talk to customers, as he is only able to process steps one at a time. He does have a work buddy with him to help remind him what he is doing and to help him stay on track, but she is not with him all the time.

Sajid needs something that will help reinforce what his manager and work buddy have shown him how to do. Sajid has trouble processing a lot of information at once, so the prompts need to be visual and break tasks down into one at a time steps that he can follow at his own pace. He hates being rushed, and if his manager asks him to do things too quickly he will slow right down and sometimes refuse to do anything at all. The prompts therefore can't overwhelm him.

Sajid's main problem is his weight. Since moving into supported living, Sajid's weight has gone up at a worrying rate, and Sajid's parents are concerned. Sajid does go to the gym on Saturday and Tuesday afternoons with a support worker, but since moving out of his parents' house his eating habits have deteriorated. He and his friends often buy chips and burgers from the takeaway opposite his house. His support worker helps him make a healthy lunch to take to work with him, but he often chooses to visit the corner shop on the way to work and buys chocolate, crisps and fizzy drinks for lunch.

Sajid needs help making healthier choices without being prescriptive. It would be ideal if he could have a visual list of healthy snack and meal options that he can choose from. He also needs to be reminded

what foods are healthy and he can eat lots of, what foods he can eat sometimes and what foods he can eat a few times a week. It would also be good if these could correspond with the traffic light system of food he sees in the supermarket where he and his support worker buy food.

Sajid likes to socialise and spend time with friends. However, he only really visits other people when his support worker is with him, and he would like to visit friends more independently. Sajid isn't very good at remembering when events are happening, and last week missed his friend's exciting bowling party because he forgot what day it was on, which he found incredibly frustrating.

Sajid needs to be reminded when social events are happening so he doesn't miss out. Ideally, Sajid could use an app that gave him prompts when to get ready, when to leave the house and what to take with him. He doesn't process lots of information well all at once, so he needs to be reminded to do one thing at a time and given plenty of time to do it before going onto the next step.

Persona



Rachel Patterson, UK

General information	Condition	Technology
<p>Age: 23</p> <p>Gender: Female</p> <p>Family/support: Lives with her mother in a single parent household. Regular contact with grandparents</p> <p>Living conditions: Lives in the family home.</p> <p>Hobbies/Interests: She enjoys make up, dancing, Eastenders and chocolate.</p> <p>Attitude/Feelings: Rachel is not very confident and feels her mother treats her like she is still a child, but is unable to articulate this to her mum. She does enjoy her work, as it makes her feel more grown up and independent, but in the future she wants to become a beauty therapist. She would also really like to have more friends, a boyfriend and to move into her own flat.</p>	<p>Cognitive:</p> <p>Sensory: Poor visual acuity (wears glasses). Poor hearing.</p> <p>Motor: Difficulty with some fine motor skills.</p> <p>Body:</p> <p>Everyday Life</p> <p>Skills: She can clean and tidy, and use a Hoover.</p> <p>Limitations: Rachel has difficulty cooking and food shopping. She also cannot travel independently yet.</p>	<p>Technology use: Rachel can use a computer, and she attends an IT club for people with learning disabilities on Fridays in her local library.</p> <p>Attitude towards technology:</p> <p>Rachel wants a smartphone for her birthday and her grandparents have promised to give her one, but her mother is worried she won't understand it and will simply lose or break it. Rachel finds small screens difficult and dislikes small buttons. It would be better for Rachel to have an inexpensive tablet rather than a smartphone. She can then download useful apps onto Rachel's tablet and show Rachel how to use them. She will also let her get used to it at home before she uses it out and about.</p>

Scenario

Rachel Patterson, UK

User type: Young adult with Down's syndrome -has a mild/moderate learning disability.

Actors: Rachel (23) and her mother Anna (48). Grandparents Kate (72) and Dave (75).

Help needed with: independent living tasks, socializing

Rachel lives with her mother, Anna, in a flat in Manchester. She is an only child. Anna receives some benefits to help care for Rachel but is struggling to make ends meet. Rachel's grandparents help look after Rachel when she isn't at work with Anna, but they are getting older now and soon this will not be possible. Anna is worried that Rachel's world is rather narrow and she is quite isolated, but she is equally worried that Rachel will be unsafe if she lets her have more independence.

Rachel's mother works for a hairdressers and Rachel works there with her on Saturday afternoons. She helps clean and tidy up the premises, organize the hair products and keeps the place, as she puts it, "looking nice" for customers. She also likes talking to some of the regular customers having their hair cut.

Rachel would like to move into her own house, but her mother is worried she won't cope on her own, even with support. Her grandparents think that their daughter is putting too much pressure on herself and needs a break, and that it would be better for both her and Rachel if Rachel moved out into her own flat nearby. However, Rachel's mother does most things for her and she isn't quite ready to move out just yet.

Rachel needs some help learning how to do independent living tasks. Rachel's family could help her by teaching her how to do things like washing her own clothes and hovering step by step, and the app could remind her which days and times these things need to be done. The app could take her through the process in simple steps, which she can follow at her own speed.

Rachel enjoys dancing in her room to exercise videos but she wants to join a dance club to meet more people. However, she struggles to do things separately from her mother, and her mother also struggles to balance letting her have more freedom and keeping her safe.

Rachel needs to be gradually given more independence in a way both she and her mother feel comfortable with. For example, she could travel with her mother on the bus, whilst using the apps step by step guide to what to do when travelling on a bus, with visual prompts to stick out her hand, get out her bus pass, put it away in a zipped up pocket, etc. Once she is used to this, her mother can take her to the bus and she can travel on the bus by herself one way, gradually building up step by step until she is able to travel to and from dance club on her own.

Rachel is naturally quite shy and would like more friends. She did make friends when she went to college, but unfortunately she lost contact with almost all of them, as she didn't remember to call them or respond to their messages on Facebook. Rachel doesn't understand this is why they don't talk to her and she thinks they don't like her anymore. This lowers her self-esteem and makes her worried that no one will want to be friends with her at dance club.

Rachel needs some help making and keeping friends. She could use weekly reminders to maintain friendships – for example, the app asks if she has called any friends this week, and suggests she does so now if she hasn't. It could also remind her when social events are on, and tell her well ahead of time to get ready, and then when to go out, and what to take with her. Combined with the right support from the people who support her, the apps on her iPad could help Rachel gain more confidence in herself and her value as a person.

Persona



Jennifer, UK

General information	Condition	Technology
<p>Age: 19</p> <p>Gender: Female</p> <p>Family/support: Lives in the family home.</p> <p>Living conditions: Jennifer lives with her mother and stepfather and her. She lives in a semi-detached house in Oxford. Her stepfather is a dentist and her mother works part time for the council.</p> <p>Hobbies/Interests: likes pop music and animals and wants to look after animals as a job. She likes to read, listen to music on the family laptop and watch animal documentaries. She volunteers at an animal rescue home on Saturdays for two hours, helping feed the cats and dogs and clean the pens.</p> <p>Attitude/Feelings: Jennifer is quite a shy, anxious person and quietly spoken, but she gets very</p>	<p>Cognitive: Mild/Moderate learning disability</p> <p>Sensory: Poor visual acuity</p> <p>Motor:</p> <p>Body: Jennifer has some health difficulties and gets tired quite easily. She is coeliac and eats a gluten free diet.</p> <p>Everyday Life</p> <p>Skills: She enjoys reading Animal Ark books and her writing is very neat.</p> <p>Limitations: Rachel struggles with numbers, sense of time and timetables, which has led to difficulties at college. She struggles to understand money and shopping.</p>	<p>Technology use: Jennifer uses her mother’s laptop at home. Her mother logs her on, but once she is on the computer she can do most things without much supervision. Jennifer has used an iPad quite often at school and college, and finds it quite easy and intuitive.</p> <p>Attitude towards technology: Jennifer likes the laptop but would like her own iPad. However, when there is a technological error, she finds that anxiety provoking, as she thinks it’s her fault.</p>

animated when talking about her interests and has several very close friends from college. She likes living with her family and doesn't want to move out yet. She would however like to be more independent and have more friends.

Scenario

Jennifer, UK

User type: Young adult with Down's syndrome

Actors: Siblings – Sarah (14) and Joe (16), Jennifer (19). Parents – Karen (45) and Adam (49).

Help needed with: time management, money management

Jennifer is studying a Life Skills course at a mainstream college twenty minutes' drive from her home. She is quite shy and quietly spoken, but she gets very animated when talking about her interests and has several very close friends from college.

At school Jennifer had very good support and was well included, but the transition was not handled very well and Jennifer initially struggled to adapt to the change. Staff at the college were not very aware of the learning profile of people with Down's syndrome, and had low expectations. Her parents had to get heavily involved with the college, but Jennifer is now making better progress. She enjoys college more and loves learning new things, especially English, Dance and IT. However, she still has difficulties.

Jennifer finds it hard to remember where she is supposed to be. Jennifer's mum goes through the timetable with her in the mornings but once she is at college she tends to get anxious and forget what her mum said. She struggles with the timetable and is sometimes late just because she was doing something else and forgot what time it was. Jennifer hates being rushed and will panic and freeze if she is suddenly told to go somewhere. She also often forgets important things she needs for college, such as her timetable, her mobile phone or her work book, and tends to leave personal items like her coat in classrooms.

Jennifer needs a way of being reminded of what she needs to take to college. The reminders should be visual as well as verbal/textual, as she has strong visual skills. Reminders should be step by step, as Jennifer finds too much information at once intimidating. There should be plenty of time between each step, so Jennifer doesn't feel rushed or intimidated. Jennifer's timetable should also be simple, clear and step by step, with a prompt in advance. The prompt should also remind her to pack up all her things before she moves on. This will give her time to make sure she has everything before she goes to the next place.

Jennifer is not confident with money and numbers. Her parents buy almost everything for her and not very experienced with handling money. She brings her own lunch that she makes with her mother to college, which means she misses out when her friends go to the cafeteria and buy lunches together. When her mum gives her money for a snack, she tends to drop it or forget to take it with her. She is also too shy to go shopping with her friends at college at weekends, which she would really like to do, because she does not want her friends to know she struggles with prices and counting.

Jennifer needs help getting used to handling her own money and going shopping. Whilst her parents will play a key role in supporting this, gradually taking her through how to pay for things and shop more independently, the app could reinforce this support. Jennifer could use prompts to remember to bring money with her to buy food. If she buys particular items at the cafeteria, the app could remind her how much these cost and what coins she needs to use to pay for them. She could also use the app to help her step by step with shopping, reminding her to go to the till and what notes and coins mean. The app should be visual, since Jennifer finds number intimidating.

Persona



Elisabeth Hansen, Norway

General information	Condition	Technology
<p>Age: 15</p> <p>Gender: Female</p> <p>Family/support: Lives with parents and two sisters (17 and 13)</p> <p>Living conditions: Spacious villa in nice, suburban area</p> <p>Hobbies/Interests: sports (skiing, ice skating, cycling, dancing, music, swimming, playing with Barbie dolls, friends)</p> <p>Attitude/Feelings: <i>"I've had a great day in school. I've been positive and listened to the grownups. I love my family. I wish I could see more of my friends from my old school".</i></p>	<p>Cognitive: Down's syndrome. Mental age lower than physical. Needs a long time and many repetitions to learn. Abstract matters difficult (e.g. maths)</p> <p>Sensory: Reduced sight. Wears eye glasses. Has a reading TV in school.</p> <p>Motor: Very good considering her diagnosis. Challenges: fine motor movements, articulation.</p> <p>Body: Needs to be reminded to clean up her face, hands etc. Needs assistance to cut nails. Otherwise she manages herself. Is allergic to gluten and is well aware of this and mindful of what she eats in this respect. Loves food and could easily eat too much.</p>	<p>Technology use:</p> <p>Easy kitchen appliances</p> <p>TV and reading TV</p> <p>DVD</p> <p>iPhone</p> <p>iPad</p> <p>PC</p> <p>Other electronic games</p> <p>Attitude towards technology:</p> <p><i>"I love to watch TV series like Frustrated house wives, Grace Anatomy, Hotel Cæsar and Disney Channel series. I watch a lot of movies and play games on my iPad. I use my iPhone to make calls, send messages, play games, take photos and listen to music. I love my iPad and my iPhone. I use my PC in school to write, do homework and find things on the internet"</i></p>
	Everyday Life	

Skills: Very social, gets to know people easily. Empathetic and positive.

Limitations: Struggles with concentration over a period of time. Limited time management. Limited radius on her own outside close neighbourhood.

Scenario

Elisabeth Hansen, Norway

User type: Youth, going to school

Actors: Elisabeth Hansen (15), Nina Hansen (mother)

Help needed with: Time management, transportation, school work, learning in general, preparing meals.

Elisabeth Hansen is 15 years old, living with her parents and two sisters (17 and 13) in a villa in a suburban, residential area outside Oslo.

Elisabeth has Down's syndrome which implies general learning challenges, in particular when it comes to abstract matters (e.g. time, numbers, theoretical issues). She needs a lot of repetitions to learn, but can learn a lot and manages well once she has learned it. She is in good physical shape and enjoys a wide range of sports. She is very fond of watching TV, movies on the iPad and she listens a lot to music on her iPhone. She plays games on both devices.

Elisabeth is very happy with her life although she regrets having Down's syndrome. Fortunately, she has many friends who also have DS so she does not feel alone. She is well content with what she manages and the help she gets from her parents and other helpers. Her mother, Nina, thinks Elisabeth would benefit a lot from new technology/apps in her daily life, although Elisabeth does not see this herself. Such help could be symbols, reminders, easy instructions (e.g. cooking), messages to the carers that tasks have been done, that she has arrived safely somewhere, help to find directions etc etc. She is familiar with using new technology and could easily learn new apps.

Persona



Erik Ottersen, Norway

General information	Condition	Technology
<p>Age: 25</p> <p>Gender: Male</p> <p>Family/support: Lives in his own, small flat about 20 min drive from his parents. No sisters or brothers</p> <p>Living conditions: modern facility with five flats, shared space and a live-in assistant/care taker.</p> <p>Hobbies/Interests: skiing, motor cross, internet/virtual games, music, movies, cafes and bowling with friends</p> <p>Attitude/Feelings:</p> <p><i>"I like living on my own and taking care of myself. It's nice to have friends nearby and we have a lot of fun together. I wish I could have my own car and drive on my own to see more of my friends who live far away."</i></p>	<p>Cognitive: Down syndrome. Mental age lower than physical. Needs a long time and many repetitions to learn. Abstract matters difficult (e.g. maths)</p> <p>Sensory:</p> <p>Motor: Good. Wears hearing aid (a tiny, new electronic device which sits behind his ears permanently and does not bother him at all) due to reduced hearing.</p> <p>Body: Manages almost everything himself. Has apps that remind him to take care of his personal hygiene and general appearance.</p>	<p>Technology use:</p> <p>Kitchen appliances</p> <p>TV/internet TV</p> <p>iPhone with a range of apps</p> <p>iPad with a range of apps, watches movies, plays games</p> <p>PC with same</p> <p>Attitude towards technology:</p> <p><i>"I've used PC, iPhone and iPad all my life and know a lot of apps and games. I like it. The apps remind me of a lot of things, and it's great to have these apps instead of my mum calling me all the time to nag about this and that. I'd like to have a car that could drive me around and that I could just tell it where to go. Then I could see those of my friends who live far away more often. I speak to them on FaceTime and we play games together on the internet (bowling competitions etc.) but I'd like to see them more in real life."</i></p>
	<p>Everyday Life</p> <p>Skills: Very independent in his daily life. Gets a lot of help from assistive technology, e.g. time management, cooking aid/recopies with symbols and voice, and various reminders of what needs to be done and when.</p>	

Limitations: Concentration over a period of time. Would like to expand his geographical radius further (has GPS on his watch which helps him find his way, but would like to travel on his own by motor bike and car)

Scenario

Erik Ottersen, Norway

User type: Young adult, working in a grocery store and at a nursery home

Actors: Erik Ottersen (25), Karl Moen (35), assistant/care taker

Help needed with: Time management, transportation, money, learning in general, nutrition/weight control, cooking, take initiative to do activities. Assistive technology helps him with several of these challenges, but not all.

Erik Ottersen is 25 years old and lives in his own flat in a small, assisted housing community in a medium sized town in Norway. The housing community was initiated and initially financed by the parents of those who live there, but now the local community is responsible for running and maintaining the facility.

Erik has Down's syndrome which implies general learning challenges, in particular when it comes to abstract matters (e.g. time, numbers, theoretical issues). He needs a lot of repetitions to learn, but can learn a lot and manages well once he has learned it. He is in medium to good physical shape and needs to watch his weight and eating habits. Also, it would benefit him to do more sports activities. He spends a lot of time in front of his PC or iPad to play virtual games and needs to be encouraged to get out and be active.

Erik is content with his life and appreciates the assistance he gets from Karl and the assistive technology that he has downloaded. Karl points out that Erik's self-confidence has increased substantially since he downloaded his new assistive technology apps and learned how to use them. Karl helped to install these features and showed Erik how to use them. They are easy to grasp, with symbols, visuals and voices. These apps help Erik to structure his daily life – e.g. remind him of what he needs to do in the morning and when to leave for work. He also had apps when he started at his jobs – the apps helped him to learn the routines of his job step by step. Now he does not need these apps any more but they were very useful in the beginning. Actually, they were part of the reason why he got his jobs because it meant that he could manage his work without taking up a lot of time from the other workers having to teach him over and over what to do.

He travels by public transport and taxi (using apps to pay and call the taxi)

Persona



Niko Musterling, Germany

By Christine Schniersmeier (Arbeitskreis Down-Syndrom e.V.)

General information	Condition	Technology
<p>Age: 15</p> <p>Gender: Male</p> <p>Family/support: Two younger brothers, parents</p> <p>The family is a big team, his brothers do not spare him, they treat each other a like. They support him becoming integrated in different villages groups of young people, but they are not all the time together. Everything according school and therapy the mother is supporting him. She drives him to appointments and takes care about his homework and daily learning packages.</p> <p>Living conditions: He is staying at his parent’s home. They own a house with a garden near the city in a small wine village. He is very much involved in the children church group of his village (started with his brothers) and in all activities of his family.</p>	<p>Cognitive: His long-term memory is perfect if he had the time for over 1000 repetitions, then facts are stored and he will not forget these again. Are the repetitions accompanied with actions it will be stored a bit faster. BUT sometimes it is for sure that he knows something but he is not able to access it in that especially moment, because the words are not immediately there or the questions consists of another structure so that he cannot “open” his memory.</p> <p>He gets very frustrated if his dialog partner thinks that he does not know it and starts over with easy tasks. He reacts with refusal of performance.</p> <p>The same reaction pops up if he has to crack a problem by himself and it does not work after two or three times. His frustration tolerance is quite low.</p> <p>Sometimes he makes purposely mistakes only for not getting more difficult tasks from his teacher.</p>	<p>Technology use: He uses together with his brothers the Wii game console and Nintendo games. He is able to collect the games he wants to play and has control over the game-pad and controller. He is in practice with these devices since more than 5 years.</p> <p>He has his own mobile phone (a device for elderly people) just for emergency calls and he has stored the numbers from his parents and the integration helper.</p> <p>Attitude towards technology: He wants to be like the others and wants to use the same devices. He is very upset “only” having an old handy. But he does not have other options using the mobile phone with more features than making calls.</p> <p>His younger brother and his friends using smartphones with “What’s up” and social media functions.</p> <p>He would have no one to communicate on this base, so the parents do not see necessity for</p>

<p>He is learning/doing the same things, like his brothers do such as doing a ski course on winter holidays, making music like all family members do. He has the same rights and duties like his brothers such as helping in the kitchen, garden work, cleaning up.</p>	<p>For being concentrated it helps him to be touched with elements of a very structured teaching system (TEACCH also often used by autism).</p>	<p>him. Even it is clear that he cannot overview consequences if using social media in the wrong way.</p>
<p>Hobbies/Interests: Music (drams), football, biking, ski</p>	<p>He needs a lot positive recognitions in his learning process. Even he has a very good memory it is not sure that he can generalise skills and is able to use them in new or other situations. To improve skills he needs to practice them in different situations.</p>	
<p>Attitude/Feelings: He sees very clear the differences between his brothers and himself. This frustrates him a lot. As well at school he would like to play at the school band the drum set (he is able to do so), but is only allowed to play in the "jambe group for the special kids."</p>	<p>Sensory: He is learning through observing others a lot (this is his main strategy) and forgets there over often his own task. Being in this situation listening is impossible because of the other focus.</p>	
<p>He is a boy who is everywhere in the first row, talking to everyone (if the persons likes to hear it or not). He is self-confident and in the middle of his puberty.</p>	<p>Motor: Although he has problems in the balance, he manages riding the bike perfectly, but does not like to climb or be in higher areas.</p>	
	<p>His speech is not always easy to understand for foreigners, he speaks slow and in short word sentences. Often it is good to know about the proceedings around for a proper understanding.</p>	
	<p>Body: He has got a lot of muscles in his arms from making push-ups and lots of sports. He has a normal height and a sporty body.</p>	

He is only allowed to eat food without gluten and therefore he is on a special diet.

Everyday Life

Skills: He goes to a whole day school (till 4pm) to the 8th class. Reading and writing is on the stage of 4rd class level.

He is going by bike to school and uses the bus to a weekly appointment.

Limitations:

Often it happens that he says spontaneously “no” as an answer. This has not always to be the real meaning of what he wants to say. It is possible, that he is uncertain about the question or the questions came up a bit too unprepared or it came out of his normal rhythm, so that a “no” is just an answer but he could mean “yes”. The carer has to be aware of that and should ask again in another way for getting the right answer.

Scenario

Niko Musterling, Germany

User type: Niko likes very much game consoles, handling these is easy for him. He has a lot of practice in it. He likes also playing computer games und searching YouTube films about football and his favourite pop singers. He uses his mobile phone, but he is keen on all the devices he knows from his classmates and brothers like smartphones and tablets. He wants to have these devices too because the others are using them.

Actors: Niko (15 years), his brothers Lars (14 years) and Timo (12 years); mother Elke (41 years) and father Rainer (42 years)

Class teacher Mrs. Haller (32 years), special education teacher Mrs. Engmann (53 years), integration helper (26 years) ; 6 SST (specialist subject teachers)

Speech therapist; PeP (Praxis für Entwicklungspädagogik)

Help needed with:

- A) Niko likes to be **independently going by bike or walk around** in his village or from the bus stop to a meeting point in town. He knows well the trained ways, but he likes to find and try out new ways and gets lost in most cases. He does not care about it, because nothing bad happened till now.

A good technical support for him would be a **navigation system** in 3D (like "google earth" with all the realistic figures along his way and guide him the way quite simple and precisely orientated at the real surrounding and not on an abstract level:

"At the next red house you have to go right; right is the foot you kick the ball with (or something else) then you see a traffic light, cross the road if it is green and go further on. You see the yellow house with the big door; here you have to go through..." It needs to be in "easy to read style" and as well including the traffic rules, like "take the crosswalk, but wait till the cars standing still"

For going by bike it needs to be switched over into the road rules, like "if you come to the corner you have to stop when a car is coming from the right. Give way to the car." "You are on the wrong side of the road Or this is a one way, if you want to go further dismount and push your bike on the footpath..) For him it would help to tell "Very good, now your are back on your way" or something like this as a **positive recognitions**.

The way back home, to school or to the weekly therapist he is going by himself should be stored and with button items easily set into operation.

A good combination with the navigation system would be nice something like "face time" easily to use, so that he **could call** a family member for example and **show where he is** when he does not know to go further on. Another possibility is to do a short video clip from where he is and sends it to the carer.

"Face calling" would have the advantage that he can use some sign gestures, can show where he is and can understand the answer quite better using eyes and ears. Normally he does not use sign

gestures (he learned it in the childhood like most of the children with Down's Syndrome) but if he is excited his speech is getting more inarticulate and is hard to understand him at the phone.

- B) "Face calling" would also be a good think to **stay in contact with friends**. If it is compatible with the normal "Face time" for example he could communicate with his schoolmates who owns smartphones (asking for an appointment, asking what homework has to be done, ...)
- C) Niko is going to a **regular school**. He has got his integration helper the whole school time at his side. It is a very big school with more than 1000 pupils. It is a whole day system (Gesamtschule). He has his class teacher Mrs. Haller and his teacher for special education Mrs. Engman, next to 6 other specialist subject teachers. Mrs. Haller and Mrs. Engman and the integration helper need to (should) work closely together. They need to have in mind Nikos one's level of work (Förderplan) and have to communicate about differentiation possibilities, aims and other agreements for Niko in the whole teacher team. As well for Niko it would be perfect if the teachers communicate with the speech therapist, PeP and the parents; this would round down his support. Niko is only well supported at the integrative regular school if this system of communication is running well.

The updated information from the parents and from the teachers to the parents are important because his speech is not so distinct at any time so that teachers as well as parents only can understand the whole meaning of his words if they know about the proceedings around Niko.

At the moment his school struggles a lot, because of less time for communication and a good concept for that. The integrations helper comes into a sandwich position and is the only person at school knowing all around Niko, but she is not the person who is planning the lessons. She is in daily contact with the parents.

So Niko often does not get the proper support and his learning process is therefore slower as it could be. Sometimes the teachers using different methods so that his learning targets are getting slowly generalized and as well some contents going by so fast that he cannot store them into his long-term memory.

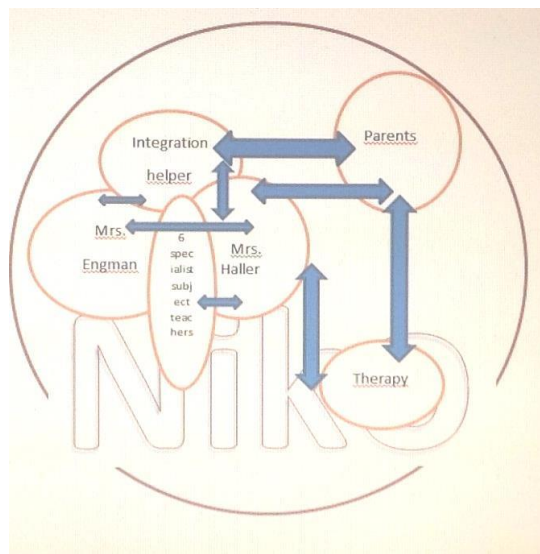
Idea: If Nikos teachers could store all about the lesson/targets/behaviour/... in a few minutes on a device in the end of their lesson or unit, in the following lesson the next teacher would have a good quick overview and all information are gathered to teach Niko on the point. And if the teacher could get into the system from home where they prepare their lessons, they would have everything at every time updated for a good planning situation and in the end the best learning possibility at school.

A good technical support could be a **communication platform like "supporting circles"**. Maybe with different levels and not every level are available to everyone (password?). All teachers interact with Niko about his goals he can react on it and put his own goal (for the day, for the week, for the month...) in the system. The whole system (or parts of it) can follow this and take out what they need for their lessons. Parents have an idea, what is going on at school and can support him at home much better. As well they can interact quickly with information which are important to know at school (medical problems or special behaviour situations, so that all persons at school know about it).

Example (1): goal: practicing cursive handwriting (every pedagogical or educational can be put in)

Now everybody knows that he should practice his writing and in all subjects he can get tasks for doing that. His mother observed that the control over the pen is different now and that his sitting position is not well. The therapist can have a look at him and the teachers can think over another pen, another sitting position....Very **quickly all persons are involved** without having long team meetings and for Niko a solution is found easily. The integration helper who is mostly the person who tells both parties (School – parent's) from goals and what happens at school, comes out of the sandwich position (she cares for Niko at school, but is not part of the school system herself) and all involved persons can interact like partners. As well Niko should be invited into this system on his level.

Example (2): In combination with a **calendar and structure systems** (TEACCH) the school day is easily planned and structured. Niko knows with this support exactly what to do and what consequences his behaviour (for example) will have. He gets a better feeling for time sequences and how quick he is doing his work. A clock going backwards could show the rest time at school, for this task, for this lesson. He can get a good feeling about the amount of tasks and his progress. To be organised and structured is the base for everything.



Persona



Karin Mustermann, Germany

By Christine Schniersmeier (Arbeitskreis Down-Syndrom e.V.)

General information	Condition	Technology
<p>Age: 17</p> <p>Gender: female</p> <p>Family/support: One younger sister, one older brother, parents</p> <p>Her grandparents are living far away but they are coming for visits six times a year and stay every time for one or two weeks.</p> <p>Her father has got big problems in accepting the situation.</p> <p>Living conditions: She lives in a single house with a garden together with her family on the fringes of the city. She has her own bedroom. She could use the train and bus to go to town. The countryside is flat so there are possibilities to cycle and walk around.</p>	<p>Cognitive: She is integrated in the normal school system and has two school years still to go. She is using school books for people with learning disabilities and in some subjects like physics, chemistry, politics she gets special easy to read material from her teachers.</p> <p>In maths she can calculate up to 1000 (+ and -). Same 1X1 tasks she knows.</p> <p>Counting with money and reading the watch is extremely difficult.</p> <p>Her auditive short-term memory buffer can take on little information therefore she needs to have not only the spoken word but rather pictures and/or active situations on top to store the full information.</p> <p>Sensory: She has glasses on (cataract is possible soon), difficulties in directional hearing and sound levels.</p>	<p>Technology use: She has no problem in using her electronic keyboard. With a mini computer and a disk she can regulate tempi, background music and the loudness.</p> <p>She likes to play sing star and other karaoke games together with her sister and friends. She finds the songs by herself and can handle the game system.</p> <p>She owns a smartphone.</p> <p>For her 18th birthday her biggest wish is a tablet.</p> <p>Attitude towards technology: Now she is happy to have her own smartphone like her brother, sister and her schoolmates. For her it is to be like them. Very quickly (in about three month she learned to use various options and started over to explain her mother how to use some functions. At the beginning she used her smartphone by try and error possibilities, mostly she learnt by watching her schoolmates doing something on their smartphone and her brother helped her a lot with</p>

<p>Hobbies/Interests:</p> <p>Horse riding, dancing, playing keyboard, reading books, watching DVD's, altar girl</p> <p>Attitude/Feelings:</p> <p>Sometimes she gets upset about being like she is. She wishes to have a boyfriend. This really hurts her. She would like to have her own family one day. Mostly she falls in love with young men, working in a carer position without any chances or in schoolfellows (without Down's Syndrome) that are friendly to her but do not see her as a potential girlfriend.</p> <p>Towards strangers she is shy, but if somebody is very friendly to her this person gets very promptly to a friend. If somebody tells her to do anything she quickly loses her own task out of mind.</p> <p>Sometimes she is living in feelings of the past. They are reality for that moment but incident to adventures long ago.</p>	<p>A different audition makes her problems in digest learning rules and to develop good organisations skills. She needs visual support, enough time and strengthening through special words of praise.</p> <p>On the other hand her visual memory is very strong; she can offset her audition problems with that. Best learning results she gets in using the EIS-principles</p> <p>(E=enactive → with specific objects)</p> <p>(I= iconic → illustration of the action)</p> <p>(S= symbolic → working symbols and writing system)</p> <p>Motor:</p> <p>She does not like to walk very quickly. But she can, if she is motivated by herself.</p> <p>In sum she is slowly in all actions of her life. She likes to do everything in the right way (pedantic) and after the same pattern. To get her faster makes her slower or to stop her action. "I have my own time."</p> <p>She does not like to be in a crowd of people or to have many people behind her.</p> <p>She learned to cycle and to swim by herself.</p> <p>Body:</p> <p>She is about 1,50m tall and about 80 kg. Her legs and arms</p>	<p>the new vocabulary and different functions.</p> <p>She is glad to have it. She uses it for calling for help on her way outside, writing SMS, chattering with a friend, taking photos. She knows about other functions (Email, Internet, social media platforms) but is not using them often. This depends mainly on other people. (Who wants to stay in contact with her and who from her friends with Down's Syndrome can use and owns this technic as well?)</p> <p>Her main contact persons with her smartphone are her family, the integration helper at school and one friend with Down's Syndrome who owns a smartphone as well.</p>
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are compared to the body shorter as usually. She has tried to lose weight for a long time, but she does not manage it. Her muscles are hypo tone. She has problems with her knees and hips. She had a heart surgery at the age of 5.

Everyday Life

Skills:

She can read and write on the level of 6th class. She calculates till 1000. She speaks in short sentences and well pronounced.

At the school building she is moving around independently and can implement tasks of her teachers by herself, like fetching something from another classroom.

Limitations:

It is very difficult for her to address if something is too complicated for her and asking for help.

Scenario

Karin Mustermann, Germany

User type: The use of technic devices is part of her live. She sees it in her family and at school. At the beginning it has been a lot of try and error operation. But she gets help from her brother. Her sister and her schoolmates are not allowed helping her. Karin wants to show them that she can use her smartphone as well on her own (it is kind of competitive and comparison situation for Karin).

Actors: Karin (17 years), her sister Tina (15 years), her brother Ben (20 years); mother Renate (48 years), father Frank (51 years)

Integration helper Ines (40 years), class teacher Mrs. Hauser (48 years); Special educations teacher Mr. Huber (31 years), 3 specialist subject teachers

Help needed with:

Karin started **up going to school by bus** once a week. This morning during the week she is not going to the school house but directly to a traineeship in a kindergarten and later on to school. It is training for getting more independence next to the working traineeship. The normal transport is a special taxi collecting her from home.

Going by bus is not possible yet on her owns. Her integration helper is waiting at the bus stop and they go together by bus. The main problem is to know how much time she needs to be prepared to leave the bus at her bus stop. And if there is a crowd of people in the bus to get motivated to go through the crowd and tell them to let her step out of the bus.

Time management, motivation and self-confidence are the main fields of support Karin needs to handle going by bus. At the moment they are not practicing yet what to do if the bus is not coming and how to handle the change of the busses on her owns.

- A) Going by bus is part of her schooling plan in cooperation with the parents and integration helper. The next step will be for the integrations helper, being in the same bus but not at the side of Karin. There is no idea jet how she will manage it, because the main problems as described will remain in force.

A good technical support could be having a **time schedule** on her smartphone showing her how long it takes till she has to leave the bus. It should not tell how much minutes are left rather than like a backwards running clock witch visualise the running time. With a **remembering function** (two times at least) that time gets less and finally she is nearly there where she has to get off. May be a signal telling her to watch at her supporting system now, like vibration / sound. If the system knows that she really got out of the bus at the right point would be great and if not, that it gives her straight away **an option** how to come to her designation now.

If this **system is connected** to the parent's home or school system /integration helper/teachers it is clear that **she will come later**, but she is on her way and no one needs to be worried about she might got lost. May be there is a **function as well for steps of independence**, so that all functions do not have to be used all the time or in times where supporting would need to be more (may be because of worth health situation for a while) the function could be switched on again.

- B) To **read the timetables of the bus stops** will be a big challenge. They are mainly printed in very unclear and confusing tables where she will not find her next bus. Finding the right direction, the right day (sometimes there are * or little numbers for special days or times and one has to watch in the footnote to find the right situation) and to be able to read a table like this is for her bad eyes a challenge and for her math structure system as well.

A good technical support could be scanning the timetable and a version she can read and understand pops up on her device or she has to give the right bus number into her supporting system and a timetable according the day and the actual time pops up, in the best way including delays.

How many minutes of delay it will be, is not the point (this is written on lightening systems at the bus stop) but to visualize how much time is left till the next bus is coming is more important. She has no idea how long 10 minutes will last, if the system just tells her “ in 10 minutes your bus is coming”, but if she can see the running time it is getting more understandable.

Time is a difficult dimension to Karin, because time cannot be seen, felt, tasted or heard. She has her own time feeling which is not the one watches tells us. Therefore she is often very slow in moving from one point to the other or is doing things in between which will cause a delay on her side. So she needs support in getting time visualised for not being always in a status of uncertainty / insecurity. Only with a good time concept Karin could get to an overview about passing on situations for example on her way using public transport systems.

Her normal reaction at the moment is that she sticks on distinct rules and if something is changing it is difficult to her changing the plan by herself. She is just sitting down and waiting something happens out of fear and not knowing how to handle the new suddenly appearing situation.

Her teachers and integration helper try to support her to get next to necessary structures as well a kind of flexibility, that means that they take over ideas from Karin and try to combine them into the daily school timetable, so that she can learn to handle better varied situations.

- C) Another big supporting point is the **use of money**.

Karin will go two more years to school. She goes to a regular school half a day (“Realschule Plus” before the system changed in Rheinland-Pflaz 2009 “Hauptschule”). It is a school where teachers for special education working as well and about 45 children with handicap to 650 children are integrated. In Karina’s class there are 4 children with handicap up to 23 pupils.

Karin has her own books in math and calculates till 1000. She is using visualising material to figure out the results. Up to 100 sometimes she manages mental calculation, but it is not available all the time. Calculating with money is every school year part of her studies. The biggest problem she has is to understand the value of the money. She can tell that she gets 20 Euros pocket money per month, but she cannot tell what she is able to buy with 20 Euros. She likes to go shopping with a friend and has in her mind she likes to buy a new sweat shirt. Before she is going to the cloth shop, they go to drink a cola and buy the new girl magazine from their favourite TV show. After that she has only about 14 Euros left and does not understand why the woman at the cash point tells her she has too little money for buying it. On another shopping tip she bought a new sweat shirt, so why this time it is not possible?

Her strategy is to give a banknote (a red one – 10 Euros- most of the time) and waits for getting money back or the cashier tells her that it is not enough. It is fine or she gives more money to him/her.

In the math lesson it works quite well to count the right numbers written on the coins and banknotes. But in a real shopping situation she sees just lots of coins and that means a lot of money to her. It is a different thing the amount of coins and the value of the coins.

As result out of this long effort to get an understanding of the value of the money a technical support could be helpful.

Idea for technical support:

- Karin is able to do a one to one mapping. So if she would have on her device a function with all coins and banknotes (with the different colour) pictured so that she could tick on how much coins she has from each one and automatically the device counts the amount together, she knows the exact sum in her purse before going shopping. Now on her shopping trip she puts (or scans) the price into the device, it shows her which coins/banknotes she has to take out and how much will be left then.
- If there exists prices which are not variable for a longer time, a carer (or herself) could store the price together with a picture on it and so there would be a possibility to check with another function if she can buy all she wants from the amount she has in her pocket before going to pay.
- It would be great if the function could extend when she starts to work, so that she would get a possibility to manage her money by herself. If there is an extra function to click on with all the things she has to pay during a month anyway she could learn to save this amount till the moment comes up she has to spend it. (It depends on the living and working situation, if carers and parents should have access to it. Probably not to all parts, but may be as an additional support from the outside.)

At the moment (school time) this function can support Karin on her way to go grocery shopping for the domestic science. Now still her integration helper supports her with the money. So the teacher puts in the amount of money she gets for the shopping and they store a list for the shopping. This could be prepared together in the lesson before.

As well she is going on sheltered holiday trips. Normally she has to give the money to the holiday carers and ask for her money during the trip or the carers manage her money as they think it is good for her. With such functions she could learn to handle her money herself.