

Assistive technologies at Visio

Designing interventions to support care professionals
with the implementation of assistive technologies
for individuals with multiple disabilities



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Acknowledgements

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Executive summary

This graduation project was conducted for Koninklijke Visio, an organization that provides day and residential care for individuals with visual and intellectual disabilities. The organization strives to enhance the use of assistive technologies, improving the quality of care, independence, and participation of its clients. Despite the availability of assistive technologies, their adoption and integration into daily care practice remain limited. In this project, I therefore addressed the following central research question:

“How do clients, supporters, and professionals within Visio engage with assistive technologies, and what does this reveal about opportunities to improve care quality?”

The project focused on three key stakeholder groups: clients, supporters, and care professionals. These three stakeholders were separately analysed. First, observations were conducted to gain insight into how clients currently use assistive technologies in practice. Second, desk research was conducted into the information, tools, and knowledge provided by the supporters of the care professionals. Third, qualitative interviews with the care professionals were conducted to gain insights into their experiences, attitudes, and perceived barriers regarding assistive technology use. The combined analyses indicated that care professionals play a key role in the adoption of assistive technologies and significantly influence both clients and supporters. As a result, I narrowed the project focus to this stakeholder group.

The core problem underlying the limited use of assistive technologies among care professionals was identified as the absence of a shared learning environment. As a result, learning largely occurs individually rather than collaboratively, limiting sustainable adoption.

Based on these findings, I explored several potential interventions and discussed these with care professionals through qualitative interviews. With the gained insights, a coherent set of interventions was designed, structured into three interconnected intervention areas. The first intervention area focuses on increasing basic technology skills, acknowledging the influence of personal technology experiences on professional behaviour. The second area aims at mapping and structuring assistive technology knowledge, providing a necessary organizational foundation. The third area focuses on collaborative learning and openness, targeting the integration of assistive technologies into daily practice and organizational culture. This intervention area consists of a recurring learning cycle that combines awareness-raising, active collaborative learning, visible knowledge in the work environment, and space for reflection and questions. These elements lower barriers, build confidence, and support the structural embedding of assistive technologies in daily practice and organizational culture. This intervention area is considered the most impactful with active collaborative learning sessions identified as the most effective intervention element (Figure 1).

The designed interventions should be understood as a starting point for further development rather than as a final answer. It is recommended that responsibility be assigned to key figures at each facility to ensure continuity and adaptation of the interventions to local contexts and team dynamics. Additionally, clear communication and appropriate framing, like using Dutch materials and minimizing the use of the term "technology", are essential to maintain engagement. Finally, encouraging care professionals to actively contribute their own interpretations and experiences can support contextual relevance and strengthen collective learning over time.

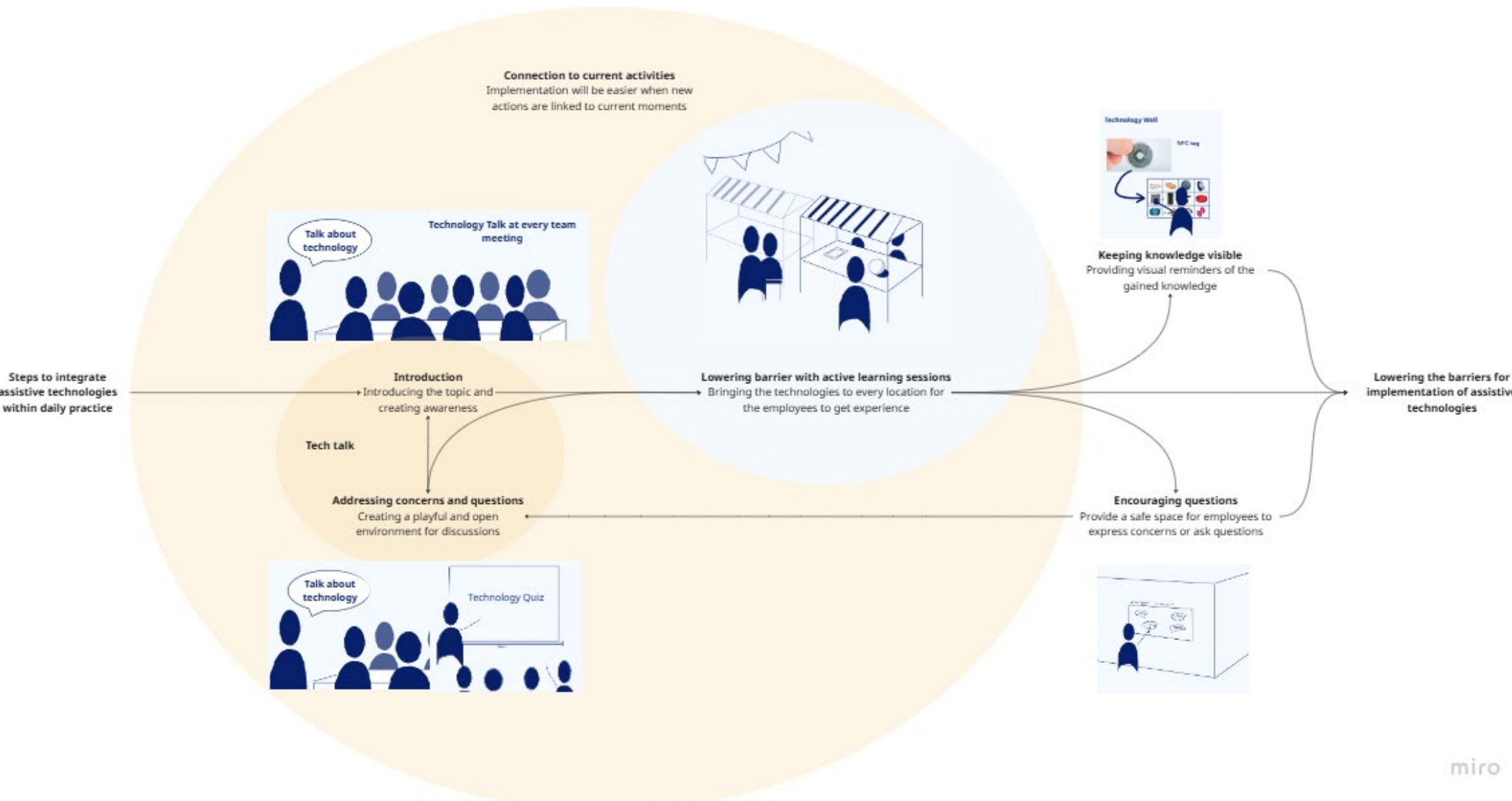


Figure 1. An overview of the interventions focused on encouraging collaborative learning and openness about assistive technologies. The interventions within the outer yellow circle need to be connected to existing activities. The interventions in the inner yellow circle merge into the recurring Tech Talk. The intervention within the blue circle is considered the most influential.

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1. Introduction

The healthcare sector is experiencing growing staff shortages and increasing work pressure. While this challenge affects the sector as a whole, care professionals supporting individuals with complex needs increasingly require innovative and sustainable ways to maintain care quality. In this context, assistive technologies can play an important supportive role.

Assistive technologies can be defined as a range of tools and systems designed to support daily activities, communication, and independence. In the care context of individuals with visual and intellectual disabilities, assistive technologies can contribute to enhancing participation, autonomy, and overall quality of life, while simultaneously supporting care professionals in their daily work.

Koninklijke Visio is an organisation providing day and residential care for individuals with visual and intellectual disabilities. The organization increasingly makes assistive technologies available in practice, but their use remains limited. As a result, assistive technologies are not utilized to their full potential and fail to provide structural support for care quality. This situation highlights the need to better understand how assistive technologies are currently engaged with in practice and how their use can be improved, leading to the following central question:

“How do clients, supporters, and professionals within Visio engage with assistive technologies, and what does this reveal about opportunities to improve care quality?”

The project focuses on three key stakeholder groups: clients, supporters, and care professionals. By gaining insight into the use of assistive technologies among the three stakeholder groups, this project aims to identify which stakeholder plays the most influential role in improving current practice. Based on this insight, the project seeks to design

interventions that support the effective implementation of assistive technologies by addressing the needs of this key stakeholder.

This graduation project was carried out for Koninklijke Visio, focusing on their day and residential care for individuals with visual and intellectual disabilities. The scope of the project includes the use and implementation of the whole range of assistive technologies among the clients, supporters and care professionals.

The research focuses on understanding the current situation and learning processes related to assistive technologies and on designing interventions that support their sustainable integration into daily care practice. However, this project does not involve the technological development of assistive technologies nor of the designed interventions. Neither has the effectiveness of the proposed intervention been evaluated. Additionally, the findings are context-specific and are not intended to be directly transferable beyond the organizational setting of Visio.

The relevance of this project for Koninklijke Visio lies within the understanding of how assistive technologies are currently implemented and used, while also identifying opportunities to improve their sustainable integration. The proposed interventions offer structural guidance for the organization to strengthen learning, collaboration, and the effective use of assistive technologies in supporting clients with visual and intellectual disabilities.

In addition to its relevance for Visio, this project provides insights into how assistive technologies are learned and used in care practice. By considering multiple stakeholder perspectives, the findings may also be useful for other care organizations that experience similar challenges in integrating assistive technologies. By supporting more sustainable use of assistive technologies, the project indirectly contributes to improving care quality under increasing pressure on the healthcare workforce.

This report is structured as follows. Chapter 2 provides an overview of the organizational context and presents the central research question of this project. Chapters 3 to 5 analyse the engagement with assistive technologies of the three stakeholder groups: clients (Chapter 3), supporters (Chapter 4), and care professionals (Chapter 5). Chapter 6 uses the insights of the analyses to identify the key stakeholder and their core problem for the limited use of assistive technologies. In chapter 7, ideas and potential solutions were explored with participants to better understand their needs and perspectives regarding assistive technologies. Chapter 8 presents a detailed description of the designed interventions, including their structure and implementation steps. Chapter 9 concludes this report by evaluating the interventions and the project as a whole and presenting recommendations for further steps to be taken.

ChatGPT was used to support writing quality and to organize large qualitative datasets, such as summarizing interview transcripts. All analysis, interpretation, and conclusions were performed by the author.

2. Exploring Visio and defining the research direction

This chapter provides an overview of the organizational context in which the research takes place. The first section (2.1) begins by introducing Koninklijke Visio, an expertise center for people with visual impairments. Visio's mission and long-standing experience are described and the role it has played in shaping the care it provides. Furthermore, this section discusses Visio's background, its core values and the range of services that support visually impaired individuals in living as independently as possible.

The following section (2.2) examines the care provided to people with multiple disabilities. It places particular emphasis on the Blauwe Kamer, which serves as the main site of this study. Section 2.3 then turns to the tools and knowledge sources that help Visio employees deliver high-quality, individualized care. Section 2.4 connects the organizational context to the research focus. In this final section, the chapter explains how Visio's approach to care and innovation shapes the exploration of assistive technologies and the interactions between clients, supporters, and professionals.

2.1 What is Visio?

Koninklijke Visio is an expertise center for individuals with various visual disabilities. The organization offers advice, guidance, rehabilitation, and education to individuals with a visual disability, enabling them to independently function in daily life, at school, and at work (Koninklijke Visio, n.d.-f).

2.1.1 History of Koninklijke Visio

Koninklijke Visio was established on the 1st of August 2009 as a result of merging three institutions: De Brink, Sensis and Visio. This merger brought together 200 years of experience in care, education and rehabilitation for individuals with a visual disability.

The origin of Visio dates back to 1808, when the first institute for education to blind children was founded in Amsterdam. In the following years, new specialized institutions were founded and gradually merged. From 1970 on, the focus gradually shifted from residential care to inclusive, home-based support and education. The last merger in 2009 led to the formation of the current Koninklijke Visio (Koninklijke Visio, n.d., -c).

2.1.2 Mission of Koninklijke Visio

“Making Participation Possible”

Ever since its founding, Visio’s mission has remained the same: ensuring individuals with a visual disability can live their life as independently as possible. Their focus is on what remains possible and giving people the strength back to do what they want. Their goal is to give the right support and guidance so individuals with a visual disability function as optimally as possible in society (Koninklijke Visio, n.d., -d).

2.1.3 What does Visio offer?

Diagnostics and advice

Visio offers support through the diagnosis of visual impairments and provides guidance on how to cope with them, including assistive tools and practical strategies for daily living (Koninklijke Visio, n.d.-f).

Rehabilitation and guidance

There are rehabilitation trainings and counselling for people who experience difficulties because of their disability. These individuals might benefit from mobility training, digital tools or adapting their living environment (Koninklijke Visio, n.d., -h).

Education

Visio has its own schools and offers guidance to students who are still participating in mainstream education. Visio provides these students with the necessary support and tools to help them become self-reliant, both in their current situation and in the future. Visio’s vision on the education of students with visual impairments is: “As normal as possible, as specific as necessary” (Koninklijke Visio, n.d.-e)

Work and re-integration

Visio supports individuals with visual impairments in participating independently in society and the workforce. This support includes coaching, career guidance, and advice on how to adapt the work environment (Koninklijke Visio, n.d.-j).

Elderly care and day care

Older adults with visual impairments can receive support from Visio to continue living independently in their own homes and to stay socially active. Visio also offers residential care for those who need additional support that cannot be provided in their own living situation, due to multiple disabilities (Koninklijke Visio, n.d.-f).

Knowledge and expertise

Visio is dedicated to enhancing the quality of life for individuals with visual impairments through scientific research and the development of innovative technologies (Koninklijke Visio, n.d.-g).

2.2 Multiple disabilities at the Blauwe Kamer

To understand Visio’s services and how they make participation possible, I visited one of Visio’s large facilities: the Blauwe Kamer. This visit served to gain insight into the daily lives of people with multiple disabilities, the ways care is organised for them, and the care supports that are used. The research and insights from this visit are reported in Section 3.1.

For individuals with multiple disabilities, Visio provides various services, including residential care, daycare programs, short-term stays, supported living, and independent living training. For children with multiple disabilities, after-school care is available, along with specialized “Kind & Jeugdcentra” (Koninklijke Visio, n.d.-a). Approximately 780 clients reside across the residential locations of Visio (Op het Veld, 2024, p. 1)

The Blauwe Kamer is an estate (Figure 2) that became part of the organization in 1963 (Koninklijke Visio, n.d.-c). It serves as a residential and care facility for individuals with multiple impairments. Clients can live there permanently, stay for short periods such as weekends or holidays, or simply attend the on-site daycare services (Koninklijke Visio, n.d.-i). During visits, it became apparent that the location is closed off and situated in a forested area. While visitors are welcome, they are expected to behave respectfully in consideration of the clients.

The Blauwe Kamer consists of 12 group homes, each accommodating six to seven residents who live with support and guidance. While they have their own private bedrooms, all other spaces are shared. Each group home is under the continuous supervision of two care professionals

members (Koninklijke Visio, 2015). Residents are encouraged to make their own choices about how they want to spend their days within the framework of the care and support they require (Koninklijke Visio, n.d.-g).

During a conversation with a care professional at the Blauwe Kamer, it was explained that the 12 group homes vary in the severity of residents’ visual and intellectual impairments, with each group consisting of individuals with a similar level of need. This ensures that the level of engagement and support remains consistent within each home.

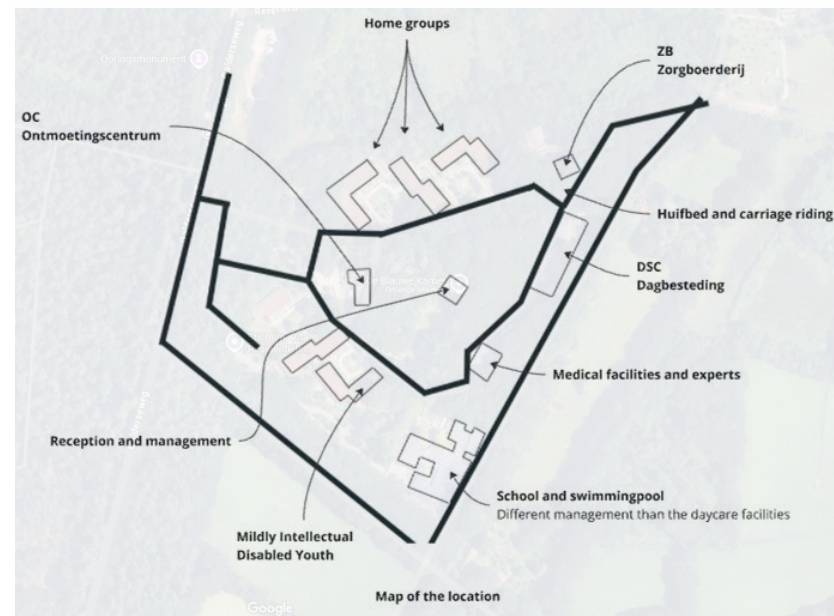


Figure 2. A map of the Blauwe Kamer highlighting the facilities

Community center

At the meeting center, individuals with a mild intellectual disability spend their days in a structured environment. They benefit from small tasks and responsibilities, such as delivering letters or assembling parts, which give structure and purpose to their day.

Care farm

The care farm is designed for clients who have an affinity with animals. They spend their time caring for the various animals that live on the farm. Some tasks can be done independently, while others require supervision. The clients at this location vary in the severity of their intellectual disabilities. They are placed here either by personal choice or at the request of their families.

Daycare Facility

Clients with more severe intellectual disabilities attend the daycare facility. They are grouped in small teams of four to five people, based on their level of intellectual disability and sensory needs. Their day is filled with activities that focus on sensory stimulation and engagement.

School

There is an on-site elementary school that provides special education to children who live at the facility, as well as children with special needs from outside the facility.

2.3 Tools and knowledge for quality care

To ensure the high-quality care Visio is known for, it is essential that care professionals have access to the right tools, knowledge and support. Visio offers various forms of assistance and knowledge to help employees carry out their work in the most beneficial way for every individual client.

The clients Visio works with often require individual and intensive support. To provide this effectively, care professionals need immediate access to clear, structured information about assistive technologies, as well as practical guidance on their use. It is vital that they understand which tools are available, how to apply them, and in which contexts they are most effective. To promote the knowledge that is already available, Visio offers multiple ways to access this information.

2.3.1 SoVisio

SoVisio is the internal social intranet provided by Koninklijke Visio for its employees. The platform was launched to enhance internal communication, facilitate knowledge sharing, and support collaboration. It offers extensive opportunities for interaction and information exchange, and it has been designed with accessibility in mind to ensure usability for all employees (Ter Harmsel, 2021).

2.3.2 Kennisportaal

As Visio is a center of expertise, it also provides knowledge and information about visual impairments and how to cope with them (Koninklijke Visio, n.d.-b). All of this information is collected on their *Kennisportaal*. The *Kennisportaal* serves as a knowledge platform for individuals with a visual (and intellectual) disability, their close ones and employees of Visio.

2.3.3 Other knowledge tools

Not only does Visio offer these information platforms, but they have also explored other ways of promoting their knowledge among employees. Visio has published multiple *Digiweets* and the *Zorg & Technologie* magazine to raise awareness about available technologies for use with clients. *Digidoen* and webinars are offered to teach new technologies and knowledge in a more hands-on manner.

2.4 Exploration of the research direction

The earlier sections show the commitment Visio has in providing quality care for their clients with multiple disabilities. Based on its ongoing efforts to improve the quality of life of clients, Visio recognizes the potential of technology to support better care and greater independence. The organization aims to expand the use of assistive technologies among individuals with multiple disabilities, as it is noticed that the use is currently not at the level Visio desires. At the same time, Visio is aware that the pressure on their care professionals is increasing, and assistive technologies could play a role in alleviating part of this workload.

Therefore, this project aims to explore the role of assistive technologies within Visio, across the chain of stakeholders. The research question guiding this exploration is:

“How do clients, supporters, and professionals within Visio engage with assistive technologies, and what does this reveal about opportunities to improve care quality?”

This question is relevant because the way clients, supporters, and professionals engage with assistive technologies reflects how these tools are understood, adopted, and shared within Visio. Visio’s mission focuses on supporting people with visual and intellectual disabilities, and the successful use of assistive technologies depends on the collaboration and interaction between these stakeholder groups. By exploring where this engagement works well and where difficulties arise, opportunities can be identified to improve both the quality of care and the cooperation between professionals.

The stakeholders involved represent different perspectives, but their roles are closely connected (Figure 3).



Figure 3. The stakeholder chain involved.



- **Clients** are the main users of assistive technologies. Their experiences and daily challenges show how these tools can make a difference in independence and quality of life.



- **Care professionals** play a key role in selecting, applying, and evaluating assistive technologies in practice.



- **Supporters**, such as internal experts, act as facilitators who aim to connect technological solutions to the care context and promote their adoption.

Visio's management and the clients' families also play a role in the wider context of the innovation process. Although these outer layers influence the overall innovation process, this project focuses on the three central groups, clients, professionals, and supporters, as they are most directly involved in the everyday use and adoption of assistive technologies.

Due to these multiple perspectives, this study takes an exploratory approach. The focus will be on exploring and defining the problem instead of solving a predetermined issue. This project aims to understand how assistive technologies are experienced and applied within Visio, and to explore where design or innovation might add the most value.

This research uses a qualitative approach with observations, interviews, and a review of Visio's internal knowledge-sharing tools. The purpose is to understand the current situation and identify where improvements are possible. The findings will later help determine a more focused project direction and how to improve the technology and knowledge exchange.

The next part of this research project is an exploratory study consisting of three parts, each focusing on one stakeholder group. Each part includes its own methods and reflections to highlight the distinct perspectives of clients, supporters, and professionals.

3. Clients as stakeholders

In this chapter, the focus of the research is on the clients. It starts with observations at the Blauwe Kamer, which provide insight into the clients' daily routines, their interactions, and the role of assistive technologies in their lives (Section 3.1).

The next section (3.2) takes a closer look at the characteristics of the clients themselves. This section provides an overview of cognitive and physical characteristics, focusing on the clients' abilities and behaviours. Based on observation and the client characteristics, design criteria are derived to help create assistive technologies that are meaningful and useful for the clients (Section 3.3).

Building on the characteristics and design criteria, a potential design direction is explored. Section 3.4 shows how the insights and criteria could be applied in practice. Section 3.5 ends this chapter by bringing these insights together and reflecting on the proposed design direction. It also emphasizes that the perspectives of the other stakeholders need to be considered before determining the best way forward.



3.1 Observations at the Blauwe Kamer

During the first two weeks of this project, observations were conducted at various locations within the Blauwe Kamer to gain insights into the clients' needs, behaviours, and interactions with their environment (Figure 4). The aim was to understand how clients interact with their surroundings, respond to assistive tools, and depend on professional support in daily activities.

The observations took place across several settings described in the previous chapter, including the daycare facility and group homes at the Blauwe Kamer. These locations provided a good impression of daily routines, social interaction, and the use of assistive tools within Visio's client population.

These observations were mainly conducted using the Fly on the Wall method. Communicating with this target group is very difficult, and asking questions rarely leads to satisfying responses. As communication with this group is limited, the Fly on the Wall method was chosen to reduce interference and observe their everyday behaviour. However, the presence of a new individual in the room can strongly influence the emotional state and behaviour of the clients. While some become curious, others may turn restless, moody, or even aggressive. As my presence inevitably influenced the observations to some extent, care was taken to interfere as little as possible. To complement the observations and add context, the care professionals were also consulted about the behaviour of the clients. To avoid judgmental interpretations of the clients' actions and reactions, care professionals were asked to elaborate on the meaning of certain behaviours. This also helped to compensate for the influence my presence may have had during the observations and provided a broader and more grounded understanding of the clients' typical behaviour. The full extent of the observations executed at the Blauwe Kamer can be found in Appendix B.

During the observations, it became apparent that assistive technologies were used only to a limited extent. While the Visio provides various tools and materials to support engagement and independence, most daily activities rely on simple, low-tech tasks such as sorting shells, feeling coffee beans, shredding paper, or feeding animals (Figure 4). Some clients engage in small routine tasks, like delivering mail to other facilities at the Blauwe Kamer, helping management perform their activities or assembling coupling pieces for PVC pipes. These job-like activities are executed individually or with the help of a care professional rather than mediated by assistive tools.

Occasionally, tablets (e.g., iPads) and radios are used to provide sensory stimulation or entertainment, but their use is not systematic or is mostly used as a group experience. Similarly, devices that could promote physical activity, such as treadmills or adapted exercise equipment (Figure 4), are only used occasionally. Even though these devices could address health-related issues such as constipation caused by prolonged sitting.

The few assistive technologies that have been introduced also evoke mixed responses. For example, when Paro the care robot (a therapeutic seal robot) was first introduced, the reactions were positive as Paro could provide comfort and stimulate emotional engagement among clients. However, the care professionals reported that Paro had responded viciously when clients handled it roughly due to their limited fine motor skills. As a result of this unwanted behaviour, they eventually stopped using it.

Another observation concerned the type of assistive technologies available at the Blauwe Kamer. Several of these tools rely on visual input, even though vision is the least effective sense for most clients. As a result, they limit both engagement and sensory stimulation.

Many of these assistive technologies, including Paro and several screen-based tools, were originally developed for use in elderly care, particularly for people with dementia. As a result, their design often requires higher levels of

visual ability and cognitive understanding than are typical for individuals with visual and intellectual disabilities. This mismatch further limits the effectiveness of these assistive technologies and highlights the need for solutions specifically adapted to this user group.

These examples shows that the success of assistive technologies in this context depends not only on their potential value but also on their robustness, reliability, and suitability for clients with both visual and intellectual disabilities.

This limited and inconsistent application of assistive technologies reveals an opportunity to better support clients' autonomy, engagement, and wellbeing through the use of assistive tools. To identify how such tools could be more effectively integrated, several observations were made that improved the understanding of the clients' everyday needs and ways of interacting with their environment.

These observations showed a few consistent general needs among clients with visual and intellectual disabilities. Their daily life depends strongly on structure. Familiar routines, consistent care professionals and predictable surroundings help create a sense safety. Simplicity is also deemed important as even small tasks often need to be broken down into small, clear and manageable steps. Many clients responded positively to sensory input, especially sound and touch. These sensory inputs helped them stay focused and engaged. Lastly, safety is a continuous concern. Materials and tools need to be strong, easy to clean and appropriate for clients who engage with their environment through touch and by mouthing objects.



Figure 4. Pictures taken during the observations showing different activities of the clients.

3.2 Characteristics of the client population

Building on the previous observations, the following section summarizes the key characteristics of the clients, clarifying the context in which new assistive solutions will need to function. Details can be found in Appendix B.

Cognitive and Developmental Characteristics

Abilities and Communication

- Wide range in cognitive abilities, even within the same group.
- 90% are non-verbal and do not understand spoken language.
- Some clients are socially aware while others have minimal environmental awareness.
- Careg professionals can interpret individual sounds and gestures.
- Encouragement and usage of names can be motivating.
- Clients struggle to explain preferences or reasons.

Need for Structure

- Routines and fixed schedules are essential and offer stability.
- Unexpected changes cause stress and behavioural issues.
- Familiar caregivers reduce anxiety.

Attention and Task Design

- Short attention span: ideal activity lasts 10 minutes, max 45.
- Tasks must be simple, engaging, and adapted to each client.
- Meaningful daily tasks are highly valued.

Emotional and Social Sensitivity

- Negative experiences can reduce skills or confidence.
- Some seek reactions or attention from others.
- Visitors are noticed, but interaction may be limited.
- Loss of structured social routines reduced engagement.

Understanding Environment

- Some clients act based on cause-effect, but lack comprehension.
- Visual overstimulation can be counterproductive.
- Awareness of the presence of animals on-site varies.

Caregiver Dependence

- Clients depend on caregivers for structure and activity.
- Guidance is needed, even if some understand basic cause-effect.

Physical and Sensory Characteristics

Motor Skills

- Physical abilities vary widely.
- Some have malformed hands or limited fine motor control.
- Tasks should be adjusted to the motor capabilities of the clients.

Sensory Processing

- Sensory perception differs; some are blind or visually impaired.
- Tactile input and movement can be calming or even necessary.
- Repetitive sensory actions are common.
- Sound feedback is experienced as motivating.

Safety Risks

- Mouthing objects poses choking hazards.
- Clients may handle objects roughly or even break them.
- Interaction with devices may be unpredictable.

Technology and Adaptation

- Care professionals have a desire to use more technology.
- Any new tools must fit the existing visually adapted environment.
- Hands-on learning and simple technology use are key.

3.3 Design criteria for supporting clients with visual and intellectual disabilities

Based on the observations and informal discussions with care professionals at the Blauwe Kamer, several recurring themes emerged in how clients engage with their surroundings and with assistive tools. These findings suggest that designing for individuals with visual and intellectual disabilities requires a continuous balance between stimulation, safety, and structure.

The following design criteria show the most important considerations when developing activities, tools, or technologies for this target group. These are not fixed rules, but guiding principles derived from practice. Their purpose is to help ensure that designs are accessible, meaningful, and supportive for both clients and caregivers.

These principles serve as a framework for designing solutions that align with the specific needs of clients at the Blauwe Kamer, but could also apply to the clients of other Visio locations. In the next section of this chapter, these criteria are applied to define an initial concept direction. The focus will be on how assistive technologies can provide and support a meaningful and structured client activity.

Physical and sensory accessibility



- Accommodate a wide range of motor and cognitive abilities by utilizing large and easy-to-grasp components.
- Provide tactile and auditory stimuli that provide engagement for the clients, but avoid overstimulation.
- Ensure clear cause-and-effect responses so clients can understand the impact of their actions.
- Include both repetitive and varied elements to maintain attention across different ability levels.
- Design activities to be enjoyable for both passive and active participants.
- Assess whether visual elements support or distract from the experience.

Structure, predictability, and emotional safety



- Maintain consistent routines and avoid sudden changes in activities or materials.
- Limit tasks to periods of 10–45 minutes to match the attention spans of the clients.
- Prevent fear and frustration by making activities clear and forgiving when mistakes occur.

Independence and caregiver support



- Arrange activities that are self-explanatory and promote independent engagement.
- Employ products that include safety measures to prevent mouthing or unsafe use.
- Ensure easy setup with minimal supervision and verbal directions required by care professionals.

Meaningful and structured activities



- Design tasks that provide clients with a sense of purpose and contribution by, for example, simulating chores or work activities.
- Make sure activities provide a balance between structure and motivation to encourage both focus and repetition.
- Include small and achievable goals that provide a sense of accomplishment and stimulate positive self-perception.

Social interaction and behaviour management



- Encourage positive and structured interaction.
- Avoid interactions that trigger competitive or conflict-driven behaviour between clients, or trigger fears caused by past traumas.

Contextual and technological integration



- Adapt into existing facilities, routines, and spaces.
- Consider simple, accessible ways to integrate technology where appropriate.
- Address concerns about declining activities that support well-being and participation.

3.4 Identified concept direction 1: Enhancing the sensory experience

The previous sections described the main characteristics of the client population at the Blauwe Kamer and formulated design criteria that guide interaction with this group. Based on these insights, a first concept direction has been defined that translates the observed needs into a tangible concept. Appendix C presents other possible concept directions that were identified but were not chosen for further development. A design goal was formulated for this direction.

Design goal: Develop an interactive installation that enhances the sensory experience of people with visual and intellectual disabilities.

To answer this design goal, I explored the concept of an interactive lamp. It is a low-threshold concept that allows clients to engage with through touch. This interactive installation offers clients a safe and stimulating way to experience light, vibration, and sound. For now, it is referred to as a lamp to maintain the association with screwing in light bulbs for the care professionals. However, for the clients, it is an interactive installation specifically designed for tactile interaction.

Many of the experiences currently offered to clients rely on screens, even though this particular group benefits little from them. Examples include the *Belevenistafel*, *Tovertafel*, *Pillo*, *Snoozy cushion*, *Fietslabyrinth*, a treadmill with visual input, and the *Nebula Apollo*.

This interactive lamp aims to provide an alternative. It offers an engaging, sensory experience that does not depend on screens but instead encourages direct, physical interaction. The following sections outline seven design elements that define this direction and explore how each contributes to meaningful engagement for the clients.

General

Each "light bulb" can have a unique character and is connected to the others. The varied characteristics of each bulb can stimulate different senses, creating a valuable sensory experience. This allows the installation to offer both calm and energetic moments, adapting to the needs of the user (Figure 5).

Connecting all the bulbs in the installation among themselves allows for interactive games to be programmed. This adds an element of play to the interaction. The bulbs are chosen because they are familiar and recognizable objects, making it easy for employees to rearrange the setup or replace any defective bulbs.

The installation invites clients to interact through simple touch and movement. Each action triggers a sensory response, encouraging curiosity and repeated engagement.

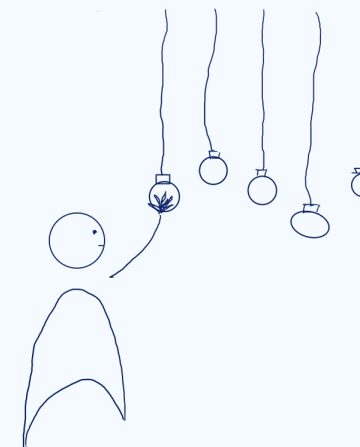


Figure 5. A representation of the interactive lamp.

Multi-sensory

Each "light bulb" can have a unique character, stimulating different senses in a variety of ways. The distinct characteristics of each bulb create a rich sensory experience through diverse tactile materials and textures.

The bulbs can offer combined sensory experiences, such as texture with vibrations, light, or sound (Figure 6). The mix of sensory elements encourages engagement. It creates an immersive experience that suits different sensory preferences.

Different textures and materials



Combined sensory experiences



Figure 6. An overview of the different textures, materials and combined experiences

Mood

The installation can be adapted to different moments, supporting both calm and active engagement. By adjusting its sensory output, the installation can either help users relax or stimulate interaction and movement. This flexibility makes it suitable for use in different environments.

To promote relaxation (Figure 7):

Soft, calming light colours

Gentle and soothing sounds/music

Soft materials for a comforting tactile experience

Relaxing scents?

Relaxing scents?

A focus on calming heart rate and breathing

To encourage stimulation and engagement (Figure 7):

Various and alternating light colours

Familiar sounds/music

A wide variety of tactile materials

Distinctive scents?

Different vibrations in different elements



Figure 7. Impressions of the different moods of the installation.

Interactive games

By linking the bulbs, basic interactive activities can be programmed (Figure 8). The installation responds to the client's touch, encouraging them to engage or reach out. This invites clients to explore through play and gentle interaction, turning a simple action into a meaningful experience.

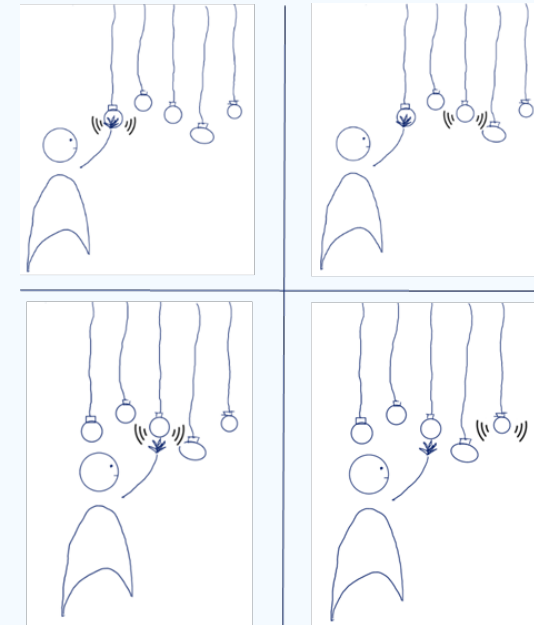


Figure 8. An example of how the installation can be used for games.

Light bulb

A light bulb is a recognizable and familiar object, making it easy for care professionals to rearrange the setup or replace any defective bulbs (Figure 9). This flexibility allows the installation to be easily adjusted to the needs of the clients and remain fully operational even when defective bulbs occur. This supports ongoing engagement and interaction without having to rely on any technological support.



Figure 9. Examples of the interaction of changing a light bulb.

Adjustable height

The height of the bulbs can be adjusted to accommodate clients who are unable to stand independently and need to remain seated or lying down. Through a simple pull-cord mechanism (Figure 10), the bulbs can be easily raised or lowered to the preferred height. This ensures that every client, regardless of mobility, can fully engage with the interactive installation (Figure 11). This flexibility allows for a more inclusive and personalized sensory interaction.



Figure 10. An example of a pull-cord.

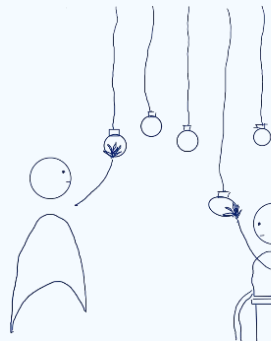


Figure 11. A representation of how the installation can be used at different heights.

Visual output

Many of the experiences currently available to clients rely on screens or require a screen to initiate interactions. Many of these products primarily rely on visual output, despite the fact that vision is the least effective sense for most clients (Figure 12). This limits both engagement and sensory experience. Shifting attention from screens toward other senses enables more engaging and inclusive interactions that correspond better to individual needs.



Figure 12. Examples of assistive technologies with visual output.

3.5 Synthesis of client insights and concept direction

In this chapter, research was conducted into how the clients of the Blauwe Kamer engage with assistive technologies. An understanding of the clients, their activities, and their needs was built.

The explored concept of an interactive lamp offers a first translation of the observed needs of clients into a potential design concept. This direction also builds on the observation that many existing assistive technologies are not well-suited to the abilities and characteristics of clients at the Blauwe Kamer. This mismatch may explain the limited and inconsistent use of assistive technologies in daily care. The proposed concept therefore aims to address this gap by providing a solution that better fits the clients' sensory, cognitive, and behavioural characteristics.

The solution is based on the carefully considered assumptions derived from observations of client needs and behaviours. These assumptions suggest that this type of assistive technology could be most beneficial for the clients. Further research and testing would be necessary to confirm its effectiveness and ensure it truly addresses their requirements. However, to

truly understand the value of this direction for Visio, it is necessary to consider more perspectives.

The successful use and implementation of assistive technologies depend not only on the experiences of clients but also on how professionals and supporters interact with such tools. Their attitudes, routines, and knowledge-sharing practices are key factors in the introduction and implementation of new technologies in daily care.

Understanding how care professionals engage with assistive technologies, how supporters share and facilitate related knowledge, and how clients interact with these tools will help determine which stakeholder group holds the most potential to enhance their effective use in daily care. Therefore, the next phase of this research focuses on exploring these other stakeholders. First, the focus will be on the supporters, as they play a key role in sharing and facilitating knowledge about assistive technologies. Supporters are examined first because of their mediating role, which can guide and influence how professionals later engage with the technology. Lastly, the care professionals are examined, as their engagement shapes how these technologies are implemented in everyday practice.

4. Visio Zorg & Technologie as stakeholders

In this chapter, the focus of the research shifts from the clients to Visio Zorg & Technologie. This stakeholder plays an important role in supporting care professionals by providing knowledge, tools, and resources related to assistive technologies. Since Visio's Kennisportaal is a key location where these supports are provided, the second direction of this study examined how this support is delivered.

Section 4.1 outlines the research method used to examine Visio's Kennisportaal, describing how the platform was analysed. Section 4.2 focuses on the accessibility of the Kennisportaal in general, focusing on how the platform is organized and how easy it is for users to find the information they need. Section 4.3 continues this analysis by focusing in on the section about multiple disabilities. In this section, the emphasis is on how clear, relevant, and usable the information is for care professionals.

Based on the findings from these sections, an overview of the identified limitations is presented in Section 4.4. Based on these insights, Section 4.5 presents a possible concept direction that responds to the issues identified in the Kennisportaal. Section 4.6 concludes this chapter by synthesizing the insights from Visio Zorg & Technologie and the proposed design direction. It also highlights the importance of considering the perspectives of other stakeholders, especially care professionals, before determining how these improvements can best be implemented in practice.



4.1 Examination of Visio's Kennisportaal

This analysis aimed to explore how the support team Zorg & Technologie provides information about assistive technologies to their care professionals. This exploration was conducted to assess the accessibility and effectiveness of the available resources, particularly for those working with clients with multiple disabilities. The previous chapter focused on the client as stakeholder, in this section, the perspective shifts to the professionals who support them.

This exploration has mainly focused on the public knowledge portal of Visio: the Kennisportaal. This online portal offers a wide range of knowledge for individuals with a visual disability. While the main focus of the Kennisportaal is on providing information on visual disabilities, there is a smaller section dedicated to individuals with visual and intellectual disabilities. This platform was selected because, during the research period, it was the only resource accessible to the researcher. Among the care professionals, the internal platform SoVisio is more commonly used. Unfortunately, this platform was not available at the time of the research. Even though SoVisio was unavailable, it is expected that this platform shares similar features as the Kennisportaal and may face the same limitations and challenges.

For this research, an online exploration of the Kennisportaal was conducted. The process involved observing the structure, navigation, and accessibility of the website, as well as reviewing the way information about assistive technologies is presented and shared. Several accessibility issues were observed during the exploration. These issues could prove challenging for users with visual impairments to navigate the site effectively. This is problematic for an organization that specializes in visual impairments.

The research was conducted in two parts. The first focused on the user interface of the Kennisportaal, evaluating its accessibility and usability. The second part examined the content specifically related to multiple

disabilities, analysing how knowledge about assistive technologies is communicated.

On the Kennisportaal, two additional sources were found: Digiweet and the Zorg & Technologie magazine. These two sources were also analysed to gain a better understanding of the knowledge sharing across different channels.

Lastly, it must be noted that this research was limited to only the publicly available materials provided by Visio on the Kennisportaal. As a result, the findings in this research only provide a limited view of the current state of all the information Visio offers its care professionals. Even though this research does not cover all the knowledge sources Visio provides, the findings likely reflect a broader pattern within different channels.

4.2 Accessibility of the Kennisportaal and Its content

As part of this study, both the interface and the informational content of the Kennisportaal were examined. While the platform provides relevant and useful material, several aspects were found that reduce its overall usability, particularly for users with visual impairments. The following points highlight the main barriers that emerged during the analysis.

4.2.1 User interface accessibility of the Kennisportaal

While exploring the Kennisportaal, it was found that the accessibility features of the online portal have some issues. Three elements immediately stood out.

Firstly, unlike the main Visio website, the Kennisportaal does not offer its own built-in read-aloud function (Figure 13 and 14). This removes the opportunity for blind users to navigate the Kennisportaal directly and forces them to first activate an external read-aloud function.



Figure 13. A screenshot of the Kennisportaal lacking a read-aloud function in the top accessibility menu

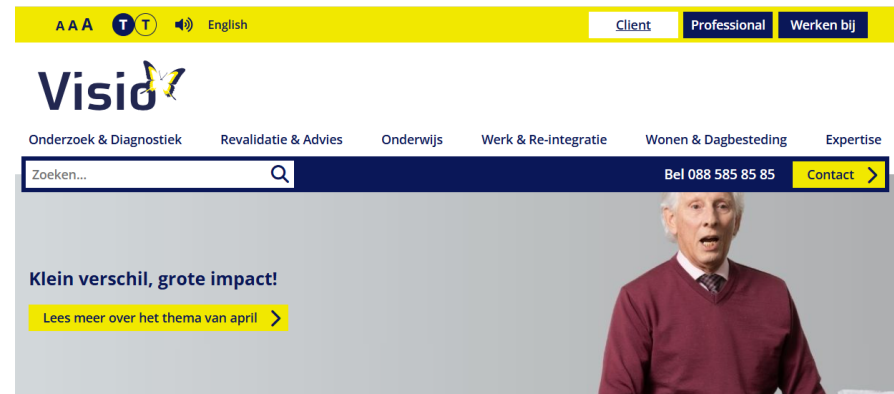


Figure 14. A screenshot of the website of Koninklijke Visio showing the accessibility menu

Furthermore, the Kennisportaal offers various interface customization options, which can support individuals with visual impairments in reading the content independently. However, during testing, it was observed that changing the text size caused several article headings to become partly unreadable (Figure 15 and 16). Lastly, enabling dark mode reduced the contrast of theme images, making them difficult to distinguish (Figure 17).



Figure 15. A screenshot of the article headings with the smallest font available

Nieuw

VoxiVision, makkelijk voorleesapparaat met AI

Apple Watch, wat kun je ermee?

Wintersport als je slechtziend of blind bent (...)

Wat is een QR-code en hoe gebruik je die?

Zelf piano leren spelen op je gehoor deel 1

Meer nieuw

Populair

Tekst voorlezen op iPad of iPhone met de sp...

Bankieren als je slechtziend of blind bent

Ergo Tips - Opruimen en schoonmaken

Talking Tuner, een pratend stemapparaat vo...

Het Thuisspeelboek voor EMB

Figure 16. A screenshot of the article headings with the largest font available



Figure 17. The pictures of the themes in dark mode

4.2.2 Online information accessibility of the Kennisportaal

While exploring the articles on the Kennisportaal, additional issues were identified within the search function that make the process of finding relevant information more complex than necessary.

When navigating through the themes on the Kennisportaal, the user selects a topic and is then taken to the next page, where additional subtopics need to be chosen before any articles are displayed. In some cases, the subtopics lead to even more subtopics before the articles are shown. This layered structure can make it challenging to find specific content, which emphasizes the importance of the search function.

However, it was noticed that the search function only returns articles that contain the exact search term. The search function does not consider the relevance or context of the word within the article. When searching for something, for example, “kwetsbaarheid” (vulnerability), the website provides four articles (Figure 18), of which three can be debated as to whether the term “kwetsbaarheid” is relevant in these articles. Upon reviewing these articles, it becomes clear that “*kwetsbaarheid*” is indeed mentioned (Figure 19), but in a different context, raising the question of whether these results are truly useful for someone specifically searching for information on that topic.

One could argue that by filtering on specific subjects, in this case, “Goed in je vel,” the three unrelated articles would no longer appear and thereby solve the issue. However, this raises the question of whether someone would actually search for “kwetsbaarheid” when trying to find out how vulnerable the eSight glasses, white cane, or 3D pencils are. This example shows a limitation in the search function, as it does not take user intent or context into account. This can lead to confusion or irrelevant results for users with specific information needs.

The screenshot shows a search results page on a yellow background. At the top, there is a navigation bar with 'Home > Zoekresultaten'. Below this is a search bar containing the text 'kwetsbaarheid' and a magnifying glass icon. To the left of the search results is a 'Filter op' section with a list of categories, each with an unchecked checkbox: Smartphone, Tablet, PC en laptop, Braille, Hulpmiddelen, Mobiliteit, Persoonlijke verzorging, Huishouden en gezin, Goed in je vel, Vrije tijd, Werk en studie, Kinderen en jongeren, Meervoudig beperkt, and Geldzaken, wet en regelgeving. To the right of the filters, the heading '4 zoekresultaten voor kwetsbaarheid' is displayed. Below this heading, four search results are listed, each with a title and a short description: 'Kwetsbaarheid, hoe ga je ermee om?', 'De eSight bril, iets voor op school of daarbuiten?', 'De witte stok, vragen en antwoorden', and '3D pennen geschikt voor onderwijs of niet'. At the bottom of the search results, there is a 'Hulp nodig?' section with two buttons: 'E-mail' and 'Bel'.

Figure 18. Results of searching for “kwetsbaarheid”

Daarna hebben we de vraag iets veranderd. Zijn de 3D pennen dan misschien een goed middel voor de docenten om snel 3D figuren te maken om iets uit te leggen aan leerlingen. Ook daarvoor bleken de pennen helaas niet geschikt omdat de kwaliteit van de figuren niet goed is en omdat het bijvullen van het filament heel precies gedaan moet worden. De **kwetsbaarheid** die daarbij naar boven komt, maakt ze niet voldoende geschikt voor de inzet in onderwijs cluster 1.

Figure 19. A screenshot showing “kwetsbaarheid” within an article

4.3 Multiple Disabilities on the Kennisportaal

The Kennisportaal includes a section that focuses on living with and managing multiple disabilities. An exploration was conducted within the "Hulpmiddelen" (assistive tools) section to gain insight into what Visio offers in terms of support and resources. During this exploration, several observations were made regarding opportunities to improve the efficiency of both the search process and the accessibility of information.

4.3.1 Article headers

Figure 20 shows the article headers within the assistive tools section. While reviewing the list, it becomes clear that the articles are not arranged alphabetically. Instead, the articles appear to be ordered by the date they were published, putting the most recent ones on top of the list. Although there appears to be an attempt at consistency in the naming of some headers, this structure is not consistently applied across all items. This inconsistency makes it more difficult for users to quickly scan or locate specific information.

4.3.2 Content of the articles

The articles on the topic of multiple disabilities provide valuable information for caregivers of individuals with multiple disabilities. However, when exploring the content, it becomes apparent that most articles are quite long, with key conclusions or takeaways buried deep within the text. Figure 21 shows an example of such an article. Note that the full length of the text is not even visible in the figure.

Upon further review, it becomes clear that the article was originally written as a Word document, which can be downloaded at the bottom of the page.

Hulpmiddelen

VVB activiteiten - In de keuken

Cadeautips voor mensen met VVB of EMB

Vvb activiteiten - Samen op pad

Vvb activiteiten - Tuinieren

Moofie Care, een interactieve beweegstok

Vvb activiteiten - Liggend spelen

Vvb activiteiten - Groepsactiviteiten

Vvb activiteiten - Werken met restmateriaal

Overzicht apps iexpress

Overzicht bevestigingssytemen

Overzicht interfaces en bluetooth schakelaars

Gamen met Nintendo Switch, toegankelijk of niet?

Een draadloze hoofdtelefoon aanschaffen, waar let je op?

De iPad bedienen met Schakelaars (webinar)

Betaalbare technologische toepassingen voor vvb of (e)mb

Technologie in de zorg voor ouderen

Workshop EHBI - spelend leren met de iPad (webinar)

Figure 20. The list of articles offered on the page "Hulpmiddelen"

While the content has been transferred to the website, the formatting appears to have received little adjustment, which affects the readability and usability of the article. This occurs in multiple articles.

Vwb activiteiten - Liggend spelen

Geplaat op 8 januari 2020

Linda van Klink, Kennisrijke Visio



Welke activiteiten kun je zoal aanbieden aan kinderen met een visuele of verstandelijke beperking (VVB) of andere meervoudige beperking (MB of EMB)? In deze aflevering uit de serie **Vwb-activiteiten** gaan we in op liggend spelen.

Voor kinderen is het fijn om een eigen plek te hebben om met materialen te kunnen spelen. Voor jonge kinderen met een motorische beperking is dat vaak in de (bed)box. Welke materialen zijn er dan geschikt om te gebruiken als er sprake is van een visuele beperking met daarbij eventuele lichamelijke beperkingen?

In dit artikel geven we een aantal tips hoe je spelmateriaal kan gebruiken en geven we voorbeelden hoe je zelf geschikt spelmateriaal kunt maken. Dan je benoemd welke tips dat zijn en hoe je daar zelf mee aan de slag kunt gaan? Lees dan snel verder.

Wie is onze doelgroep bij liggend spelen?



Bij liggend spelen gaan we er vanuit dat we het hebben over kinderen die in liggende houding met spelmateriaal spelen. Deze kinderen liggen doordat er bijvoorbeeld sprake is van een jonge leeftijd, 0-1 jaar, of omdat er sprake is van een motorische beperking. Het liggend spelen zal vaak plaats vinden in een (bed)box. In plaats van (bed)box kan je ook kiezen op een speelkleed, in een bed, op een aangepaste speelplek, of op de vloer.

De beschreven liggende houding is vaak in rugligging. Als er meer bewegingsmogelijkheden zijn kan het ook anders in en basligging ook voorkomen. Wanneer er sprake is van veel lichamelijke problemen, kan het soms ook voorkomen dat de kinderen gebruik maken van hulpmiddelen om hun lighouding te ondersteunen zoals met kussens of een ligzetel.

In dit artikel gaan we uit van kinderen die op hun rug liggen in een box. Veruit deze positie zullen de kinderen spelen met spelmateriaal dat in de box aanwezig is. Het gaat daarbij om het zelfstandig spelen met materiaal, zonder dat een ouder of begeleider het materiaal actief aanbiedt of er interactie mee probeert uit te lokken.

Bij de hele jonge kinderen van 0-4 jaar is het belangrijk om behalve de motorische ontwikkeling ook te kijken naar de normale visuele ontwikkeling. Hoe verloopt deze visuele ontwikkeling en wat kun je van je kind verwachten wat hij of zij al kan?

In bijlage 1 kun je meer informatie vinden over de normale visuele ontwikkeling. Wanneer er sprake is van een visuele beperking dan verloopt deze ontwikkeling vaak langzamer en anders.

Welk spelmateriaal is geschikt?

Om de juiste keuze voor spelmateriaal te kunnen maken, is het goed om te weten in welke visuele ontwikkeling het kind zich bevindt. Hierdoor krijg je inzicht in de keuze van materiaal wat het beste aansluit bij het kind. Het gaat er namelijk om dat het kind plezier heeft en zich zelfstandig kan vermaken in de (bed)box. Geschikt materiaal doet aan op het kind, is visueel aantrekkelijk, motorisch te hanteren en met duidelijke actie-reactie in zich.

In onderstaand voorbeeld geven we per ontwikkelingsfase aan welke materialen geschikt kunnen zijn:

1. Rugligging zonder dat het kind gaat reiken en grijpen

In deze fase is het prettig om gebruik te maken van materialen die visueel aantrekkelijk zijn. Denk daarbij aan materialen die glimmen of contrasteren zijn. Deze materialen kunnen op diverse plekken in de box aangeboden worden zodat het kind naar het materiaal kan kijken.

Voorbeeldmaterialen

Diverse lichte stof (stoffen vliegenlijst), babyboekjes, knuffels, grote contrastrijke afbeeldingen, balmyrabel.



Toepassing

- Beperk de hoeveelheid materialen tot 2-4 3.
- Plaats de materialen in het gezichtsveld van het kind op circa 30-50 centimeter afstand, bijvoorbeeld boven de box (positief) of aan de rand van de box.
- Kies voor contrastrijk of glimmend materiaal.
- Wissel de materialen regelmatig af met nieuw materiaal, bijvoorbeeld elke week.

2. Baseline waarbij het kind gaat reiken

- Beperk de hoeveelheid materialen tot 2-4 3.
- Plaats de materialen in het gezichtsveld van het kind op circa 30-50 centimeter afstand, bijvoorbeeld boven de box (positief) of aan de rand van de box.
- Kies voor contrastrijk of glimmend materiaal.
- Wissel de materialen regelmatig af met nieuw materiaal, bijvoorbeeld elke week.

2. Rugligging waarbij het kind gaat reiken

In deze fase is het aan te raden om gebruik te maken van materialen die visueel aantrekkelijk zijn en die daarnaast ook gebruik maken of kunnen bewegen. Het gaat om lichte materialen zodat het kind deze makkelijk kan aanraken en kan verplaatsen of in beweging kan krijgen. De materialen zullen 'leilig' moeten zijn omdat het kind de materialen waarschijnlijk in de mond kan stoppen, of kan ontrekken waardoor het tegen zich aan kan vallen.

De voorkeur gaat dan uit naar zachte materialen of materialen die vast gemaakt zijn aan de box om bijvoorbeeld te voorkomen. Het gaat hier nog niet om materialen die breed vastgepakt worden en tactiel onstiek worden.

Voorbeeldmaterialen

Zachte stoffen babyboekje met knisperaaf, ballen in allerlei uitvoeringen, knuffelaar, belletjes, activiteitsbord.



Toepassing

- Beperk de hoeveelheid materialen tot 2-4 3.
- Maak de afstand tussen kind en materiaal zodanig dat het kind het kan aanraken.
- Naast zich: kussens gebruiken om te ver weglopen te voorkomen.
- Boven zich: laag genoeg hangen om er naar te reiken.
- Kies voor variatie in materialen, kleuren maar ook in geluidseffect.
- Plaats de materialen binnen handbereik van het kind. Maak eventueel gebruik van bijvoorbeeld schuimringen of elastiek om het materiaal boven het kind of aan de rand van de box vast te kunnen maken.
- Kies voor materiaal dat contrastrijk, glimmend of primaire kleuren heeft.
- Vernieuw de materialen circa elke vier weken of met nieuw materiaal.

3. Rugligging waarbij het kind gaat grijpen

In deze fase is het prettig om gebruik te maken van lichte materialen die makkelijk vast te pakken zijn en die visueel aantrekkelijk zijn. Nog beter is het wanneer het materiaal ook geluid maakt. Het is prettig als de materialen vast of anderszins veilig zijn. Het kind kan in deze fase het materiaal ook onafhankelijk kan laten vallen bijvoorbeeld op het gezicht omdat het er tegelijk naar kijkt. Ook kan het kind het materiaal oral (na de mond) gaan ontdekken.

Voorbeeldmaterialen

Open bal, rammelaar, rups.



Toepassing

- Beperk de hoeveelheid materialen tot 2-4 3.
- Maak de afstand tussen kind en materiaal zodanig dat het kind het kan aanraken.
- Naast zich: kussens gebruiken om te ver weglopen te voorkomen.
- Boven zich: laag genoeg hangen om er naar te reiken.
- Kies voor variatie in materialen, kleuren maar ook in geluidseffect.
- Kies voor lichte materialen die makkelijk vast te pakken zijn.
- Bij grote materialen zorg dat deze stevig staan zodat het kind het materiaal kan ontdekken maar niet omver kan trekken.
- Kies voor materiaal dat contrastrijk, glimmend of primaire kleuren heeft.
- Vernieuw de materialen circa elke vier weken of met nieuw materiaal.

En nu gaan we spelen!

In de box kiezen we voor materiaal maar het kind zelfstandig mee kan spelen. Observer hoe het kind met het materiaal speelt. Kun je zien dat het er plezier aan beleeft? Luik het kind om het materiaal te vinden?

De observaties zijn belangrijk om passend materiaal aan te bieden. Als je bijvoorbeeld ziet dat het kind moeite heeft om het materiaal te vinden, dan kun je het materiaal veranderen door materiaal uit een andere ontwikkelingsfase gebruiken om te kijken of het dan beter aansluit.

Tips als je het kind dat in de box speelt observeert:

Kijken

- Hoe lang kan het kind naar het materiaal kijken?
- Heeft het kind voorkeur voor één specifiek materiaal of kleur?
- Kan het kind zijn blik en aandacht verplaatsen tussen meerdere materialen?

Aanraken

- Ligt het materiaal binnen handbereik van het kind?
- Is het materiaal lichtgewicht en is het handig voor het kind?
- Heeft het kind een voorkeur qua hand of lichaamszijde?

Omgeving

4.3.3 Webinars

The webinars provided on the Kennisportaal are a valuable way to convey and gain information about new assistive tools. They allow key information to be communicated efficiently, and the use of the product can be demonstrated, either through live demonstrations or by showing videos of clients interacting with it. However, these webinars emerged primarily as a response to the COVID-19 pandemic. While they served as a strong alternative during that time, it is noticeable that the presenters were not yet fully accustomed to this form of communication.

Most of these webinars are simply recordings of live presentations that have been uploaded to the Kennisportaal. These recordings often include unnecessary footage, such as presenters waiting for participants to join or waiting for responses to polls or questionnaires. While such pauses are understandable during a live session, they become redundant and distracting when watching the replay. Applying basic editing techniques could easily remove this unnecessary content and improve the overall viewer experience.

Presenters should also be made aware that their presentation will be reused as a replay and adjust their delivery accordingly to ensure clarity and engagement for future viewers. In many webinars, a second person is present to manage the chat and technical functions, which helps reduce pressure on the main presenter. However, this support role is not visible or identifiable in the recording. As a result, all interactions in the chat, as well as responses to questionnaires or polls, lack context for viewers who watch the replay. This can make certain reactions or transitions appear confusing or disconnected, reducing the overall clarity and coherence of the presentation.

Figure 21. An example of an article

4.3.4 Digiweet

Between 2022 and 2023, a quarterly newsletter was distributed to employees, providing updates on technical developments relevant to client care. According to Wieringa (2024, p. 10), one employee mentioned that the *Digiweets* aim to promote the use of assistive technologies. However, the newsletters appear to have limited reach among the care professionals.

An additional barrier was identified during the review of the webpage on the Kennisportaal. The *Digiweets* are currently only available as downloadable PDF documents (Figure 22). This format introduces an extra step for employees to access the information, with no summary or context provided on the webpage itself. As a result, an employee must decide whether to download the file without knowing its content in advance. This not only discourages engagement, but also makes the information within the documents unsearchable through the website's internal search function.

Digiweet 3e kwartaal 2023, ict nieuws voor vvb

Geplaatst op 11 september 2023

In Digiweet lees je over ontwikkelingen op het gebied van ICT voor mensen met een visuele en verstandelijke beperking. Digiweet verschijnt vier keer per jaar.

In deze 3de Digiweet van 2023 lees je over de Digidoo werkplaatsen in Huizen en Vries, de app LeesSimpel die getest is door cliënten van de Digidoo werkplaats in Huizen, het Combord, de app ColourCode, en een website over veilig online. Natuurlijk ontbreken ook de korte nieuwtjes niet.

Download >

Home >

Figure 22. An overview of the information at a *Digiweet* webpage

4.3.5 Zorg & Technologie magazine

The *Zorg & Technologie* magazine was published once in 2024 and was developed to provide information on how technology can contribute to the self-reliance and well-being of individuals with visual and intellectual

impairments. The magazine presents real-life examples of technological tools that help clients live more independently, make their own choices, and participate more fully in daily life.

The magazine also highlights the ongoing challenges in the care sector, such as high work pressure and staff shortages. Technology may offer part of the solution to these problems. New innovations, such as voice-controlled reporting, smart diapers, and digital communication, can help make care more efficient and reduce workload, while also increasing client independence (Koninklijke Viso, 2024).

The magazine serves a dual purpose. It informs care professionals about practical applications of technology within Visio and promotes collaboration and innovation by sharing inspiring examples and real-life experiences.

Although the magazine has a clear purpose and brings together a broad range of useful information, it was noted that the content often fails to reach employees effectively (Wieringa, 2024, p. 10). When examining the magazine, it became apparent that it is a demanding read. The articles are lengthy, the layout is crowded with a lot of visual elements on each page, and the frequent use of QR codes for redirection adds to the complexity.

As a result, the magazine's core message is at risk of being lost. The density of the content and the overwhelming format create a barrier for readers, making it unlikely that the audience will fully engage with or absorb the provided information.

This magazine can be found on Visio's main website, but not on the Kennisportaal. Unlike the previously mentioned *Digiweets*, the page where the magazine can be downloaded does include a description of the general content that specific *Zorg & technologie* issue.

4.4 Insights into the accessibility of the Kennisportaal and its content

Visio offers a wide range of valuable resources to share knowledge. In the previous sections, several accessibility issues were identified during the exploration of the Kennisportaal. These issues can form obstacles for using the resources, both for individuals and for the employees of Visio itself. The following overview summarizes the most important obstacles found in both the interface of the platform and the structure of the online content.

User interface accessibility of the Kennisportaal

- 1. No built-in read-aloud feature**
The platform lacks a read-aloud function, unlike the main Visio website.
- 2. Ineffective interface customization**
Text enlargement distorts layout, and dark mode reduces image contrast.
- 3. Complex navigation structure**
Multiple clicks are required to reach articles.
- 4. Basic and context-insensitive search**
Search results are based on exact keywords.

Multiple disabilities on the Kennisportaal

- 5. Lacking formatting in 'multiple disabilities' section**
Some articles appear to be unedited Word documents.
- 6. Unstructured article headers**
Titles lack clear alphabetical or thematic ordering
- 7. Unedited webinar recordings**
Recordings include unnecessary segments.
- 8. Missing context in webinar replays**
Chat and poll interactions are not visible in replays.
- 9. Low accessibility of digiweets**
Digiweets are hard to find and only available as downloadable files without explanation or context.
- 10. Overwhelming Layout of the Zorg & Technology Magazine**
The articles are lengthy, the pages are visually crowded, and the frequent use of QR codes adds complexity.

4.5 Identified concept direction 2: Improving information about assistive technology

The previous sections described some of the identified issues with the multiple disabilities section on the Kennisportaal. Based on these limitations, a concept direction has been defined that translates these limitations into a tangible concept. Appendix C presents other possible concept directions that were identified but were not chosen for further development.

Design goal: Develop a system that improves the accessibility and usability of information about assistive technologies, enabling care professionals to quickly find and apply relevant resources.

Finding and applying information about assistive technologies for people with visual and intellectual impairments can be challenging. The process is often time-consuming, unclear, and discouraging, making it difficult for care professionals to efficiently locate and use the necessary resources. As a result, valuable time that could be spent supporting clients is lost.

By designing a system that allows employees to quickly access relevant information, we can improve efficiency and ensure that the right tools are more readily available. Simplifying both the search process and the information itself will help care professionals feel more confident in using assistive technologies, ultimately enhancing the quality of care and support provided.

The solution for this concept direction has not yet been defined. Unlike the first identified concept direction, this one is much more abstract, with no concrete solution yet in place. It also raises many more questions that still need to be explored.

General

A set of informational cards could be made available to employees, providing general information about various assistive technologies. By scanning these cards, care professionals could access more detailed information, potentially linking directly to the Kennisportaal via an iPad or other devices.

To ensure accessibility, the system should be designed to be extremely user-friendly, as many care professionals have limited experience with technology. In addition to a card set for care professionals, a separate set could be created for clients, allowing them to also engage with the product in a way that suits their needs.

However, for this system to be truly effective, improvements to the Kennisportaal's information structure and accessibility are necessary. Streamlining content and making it easier to navigate would ensure that care professionals can quickly find and apply relevant information, ultimately improving the quality of support provided.

Direct accessible information

General information about assistive technologies should be immediately accessible to employees. The name and image of each tool must be clearly visible on a card, allowing care professionals to instantly recognize which device is being referenced (Figure 23).

To access more details, care professionals should be able to scan the information, which would direct them to the relevant section on the Kennisportaal rather than the general website of the product. However, for this to work effectively, the assistive technology section of the Kennisportaal for individuals with visual and intellectual impairments will need to be restructured.

Key consideration:

How do caregivers want to quickly access concise information about assistive technologies?



Figure 23. Examples of possible information cards

Acquiring extended information

To make accessing detailed information about assistive technologies simple and efficient, employees can scan designated cards. However, the method of scanning should be intuitive and accessible to all care professionals (Figure 24).

Key considerations:

- **Method of access:** Should care professionals retrieve the information by inserting or placing the card in a designated spot, or would manually scanning it be more practical?
- **Ease of use:** If an iPad is used for scanning, will it be user-friendly for all care professionals, regardless of their technological experience?
- **Information transition:** What is the most effective way to move from brief, essential details to more in-depth information?

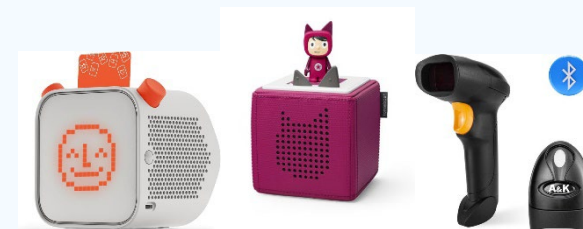


Figure 24. Examples of intuitive and accessible scanning options

Output of extended information

Once the card is scanned, the extended information should be presented in a clear and accessible way.

Key considerations:

- **Preferred format:** Should the information be displayed on a screen, provided as audio, or both? Offering multiple formats could accommodate different preferences and working conditions (Figure 25).
- **Audio integration:** Would an audio-based system be beneficial? If employees can listen to the information while performing other tasks, it could improve efficiency and ease of use.
- **Display options:** Should the system have a built-in screen for displaying information, or would it be more practical to integrate with an iPad (Figure 26)? The chosen solution should be intuitive and fit seamlessly into the care professionals' workflow.



Figure 25. An example of visible and audible output



Figure 26. An example of a tablet

Improving the Kennisportaal for assistive technologies

To enhance the accessibility and clarity of information on assistive technologies for individuals with visual and intellectual impairments, the Kennisportaal needs to be adjusted to improve information delivery.

A standardized format should be implemented so that employees can easily navigate and find the necessary information. While some articles still link to webinars, all should be embedded directly into the articles, with unnecessary footage removed to make them more efficient. Additionally, videos demonstrating how clients use and interact with the assistive tools should be included on the pages to provide practical insights (Figure 27).

Key consideration:

What format is most effective and preferred for presenting this information to care professionals?



Figure 27. An example of a video demonstrating an assistive technology

4.6 Synthesis of Visio Zorg & Technologie insights and concept direction

In this chapter, research was conducted into how the supporters of the care professionals (Zorg & Technologie) provide knowledge and information about assistive technologies. An understanding of the current knowledge, its format, and its content was created.

The proposed direction translates the discovered limitations of the digital information about multiple disabilities on the Kennisportaal into a potential design concept. Several issues were found that make searching for information about assistive tools on the Kennisportaal for this target group cumbersome and inefficient. Identifying the necessary information is challenging, and many articles contain unnecessary, abundant, and poorly structured content. The proposed concept direction, therefore, offers a concept for making this process more efficient and accessible by providing the most essential information in a tangible format and the extended information in an easily accessible digital format.

However, this concept direction is not as clearly defined as the earlier proposed direction for the clients and still raises multiple questions regarding the information-gathering preferences of care professionals. The successful use and implementation of a half-tangible, half-digital tool depends not only on providing accessible information, but also on how well its format and source align with these preferences. It remains unclear whether care professionals actually use digital platforms to obtain the information they need, making further research necessary.

The findings of this chapter also clarify how the supporters' ability to assist care professionals is limited by the accessibility and quality of the information sources they rely on. Since these findings are based solely on

an analysis of the Kennisportaal, this concept direction does not yet incorporate the experiences or routines of care professionals. Gaining insight into their perspectives is, therefore, an essential next step. The focus will be on understanding how care professionals engage with assistive technologies, as well as if and how they search for information about these technologies.

5. Care professionals as stakeholders

In this chapter, the focus shifts to the care professionals, as they are directly responsible for applying assistive technologies in practice. Their knowledge, experience, and willingness to engage with these technologies are the main determinants of successful implementation. Understanding these factors therefore forms the basis for the third concept direction explored in this project.

Section 5.1 explains the approach used in this chapter, starting with an examination of existing research and followed by interviews with care professionals. Section 5.2 discusses the findings from Visio's earlier studies and reflects on their reliability. Because these studies did not fully capture the professionals' actual experiences, interviews were conducted to gain a deeper understanding, as presented in Section 5.3. These interviews provide a more nuanced perspective on how they learn about, experience, and apply assistive technologies in their work, and which barriers affect their use.

Based on the interview insights, Section 5.4 introduces a potential concept direction that aligns with the needs and learning preferences of care professionals. Section 5.5 concludes this chapter by synthesizing the insights from the existing research and the interviews and how they contribute to the proposed design direction.



5.1 Examination of care professionals' perspectives on assistive technologies

This section describes the methodology used to examine the attitudes, experiences, and needs of Visio care professionals regarding the use of assistive technologies in daily care practice. Since the successful implementation of assistive technologies is strongly influenced by the attitudes and behaviours of care professionals, this phase of the research focused primarily on the care professionals who work directly with clients.

To gain an understanding of the current situation, a literature and document review was conducted. This includes an analysis of research previously commissioned by Visio in collaboration with several universities of applied sciences. These studies provided insight into the general attitudes of care professionals toward assistive technologies, the barriers and success factors they experience, and the influence of organizational culture and available support. Reviewing this existing knowledge helped establish a foundation for setting up interviews with care professionals.

Following this, a qualitative study was conducted using semi-structured interviews with three Visio care professionals working directly with clients. These care professionals were selected from different locations, worked with different client groups and had varied affinity with technology. This varied group of participants ensures a diversity of perspectives. The interviews explored how assistive technologies are currently used and implemented, the challenges care professionals encounter, and their views on what is needed to support broader or more effective adoption.

5.2 Visio's own research on the knowledge of assistive technology

This section provides an overview of existing knowledge and initiatives that Visio already conducted that are relevant to this project. The reviewed papers present the main insights from research conducted for and by Visio, focusing on the role of technology in supporting people with multiple disabilities, the attitudes of care professionals, and the organizational context in which technological tools are implemented. These findings form the foundation for understanding the opportunities and challenges in this field.

5.2.1 A review of the uses and effects of technology to support care professionals

Piekema (2022) conducted a study for Visio in collaboration with the *Academische Werkplaats EMB*. In this study, Visio care professionals were asked to complete a questionnaire about sharing and using knowledge regarding assistive technologies for individuals with both visual and intellectual disabilities (Piekema, 2022).

The results showed that care professionals preferred source of knowledge is direct communication with a colleague. Other frequently used sources were SoVisio and the Kennisportaal. When it came to learning preferences, employees most appreciated learning in small groups through short training sessions or brief explanations. Experimenting independently and observing a colleague were also rated highly.

The study also found that 22% of care professionals did not know whom to approach with questions about assistive technology for individuals with visual and intellectual disabilities (Piekema, 2022).

5.2.2 The influence of the attitude of care professionals

Rijpekema (2022) conducted a research to find out the “attitude” of Visio's care professionals towards the use of technology in the work field. This research found that the overall attitude of care professionals toward technology is “above average”. The data indicate that younger care professionals integrate technology into their care routines more quickly and perceive the required effort as lower than older care professionals. Gender also appears to influence effort expectancy, with female respondents expecting to invest more effort in implementing technology within their care practices than males.

This research includes the questions asked to care professionals in the appendix. Upon analysing these questions, several concerns arise. For each variable of the attitude concept, only three or four questions were included. Most of these were phrased positively, such as “using technology is easy for me.” This makes the items rather suggestive, allowing participants to guess the expected answer and potentially respond more positively than they truly feel. Additionally, such phrasing creates a positively biased baseline, making it psychologically harder for participants to disagree. Finally, the questionnaire appears to lack items that explore whether and how often professionals actually use technology in their daily care practices, which limits insight into the connection between attitude and real-life behaviour.

5.2.3 The implementation of technological tools on an organizational level

Spoelman (2022) conducted a research for Visio that shows organizational conditions play a substantial role in the successful adaptation of technological tools. Almost half of the care professionals (46.2%) report that they are not sufficiently involved in choosing or developing these tools.

Furthermore, 40.2% indicate that staff shortages make it difficult to integrate new technologies into daily routines.

5.2.4 The attitudes of support people

This research by Piekema, ten Brug, Waninge, & van der Putten (2024) builds on the work of Rijpkema by further examining the role of Visio care professionals' attitudes toward technology. Their findings show that a positive attitude is closely linked to the intention to use technology in everyday practice. When technology is perceived as easy to use, this perception allows for a more positive attitude, which in turn increases the intention to use it. Younger care professionals may be more positive about technology, yet it is attitude rather than age that determines usage intention. These insights suggest that efforts to integrate technology into the daily routines of care professionals should prioritise strengthening positive attitudes and reducing the perceived complexity of technological tools.

Although the authors do not comment on this in the results section, the article by Piekema et al. (2024) suggests that there is still a considerable group of respondents who remain neutral or even hesitant about using technology. Most participants expressed positive views, yet on several items, approximately 30 to 40% of respondents gave neutral or negative answers. This may indicate that, despite generally positive attitudes, a sizeable group is still unsure and hesitant about using technology in their daily work. These neutral or negative responses suggest that there is still room to improve the perception and support the use of technology in the workplace.

5.2.5 The Escapebox "Melle's Mysterie"

The gamified learning approach by Wieringa (2024) is designed to encourage the adoption of assistive technologies in daily care routines among Visio care professionals. By working through puzzles and engaging

with realistic care scenarios, caregivers gain hands-on familiarity with different technological tools while gradually uncovering the needs of a fictional client. Early findings suggest that the Escapebox helps raise awareness of the importance of adopting technology and supports the exchange of knowledge among caregivers.

5.2.6 Board Game

Building on the original concept, the Escapebox was transformed into a board game, making it more suitable for use in team meetings and on the work floor. The board game allows two teams to play against each other. For each case, players discuss and decide which assistive technology best fits the client's needs (Figure 28). Providing the best or a good choice allows the teams to move forward of the board (Koninklijke Visio, 2025). This board game is currently being further developed to better align with the needs of the care professionals (P. Op het Veld, personal communication, n.d.).



Figure 28. The board game developed by Visio

5.2.7 Key insights and considerations

Attitude plays a key role in changing behaviour toward the use of technological tools. A positive attitude significantly increases the intention to integrate technology into daily practice. However, research shows that just under half of the care professionals remain hesitant about using technology. This emphasizes the need for intervention that promotes positive experiences with technology to increase confidence and willingness.

Additionally, direct colleagues and experience-based learning are regarded as the most valuable sources of knowledge. In response to this, the Escapebox and board game were developed. By using gamified elements, both tools provide a low-threshold and engaging way for care professionals to explore assistive technologies. This helps strengthen their familiarity, motivation, and overall involvement.

Even so, limited organisational involvement and the widespread sense of staff shortages continue to hinder the sustainable use of technology. Without addressing these structural conditions, even well-designed interventions may fall short of achieving long-term impact.

Interestingly, Visio's response to the identified issues in knowledge sharing and involvement was to swiftly develop interventions such as the Escapebox and the board game. While these initiatives could be useful and valuable, although these initiatives may offer value, little attention has been given to the underlying reasons why care professionals hesitate to use technology, including high workload, restricted autonomy, or previous negative experiences. A thorough exploration of these factors could further improve the effectiveness and relevance of such interventions.

5.3 Interviews with care professionals

The previously examined research provided by Visio showed several significant limitations. As this research included questionnaires with biased questions and results that primarily focused on outcomes that substantiated their hypothesis, a better understanding of the current mindset of care professionals towards assistive technologies is needed. The outcomes of the earlier research are therefore not fully reliable, making it necessary to conduct qualitative research into the attitude and mindset of care professionals regarding assistive technologies.

Additionally, from discussions with employees of Zorg & Technologie, it became clear that the actual use of assistive technologies among care professionals is very low. This was further confirmed through observations at the Blauwe Kamer and conversations with care professionals there. Combined with findings from other studies showing that large groups of professionals feel insecure about using assistive technologies and are unsure where to turn with questions, it is clear that the current use of assistive technologies is not yet at the level Visio envisions.

The goal of this qualitative research is to gain insight into how care professionals learn about and engage with assistive technologies, as these two aspects form the basis on which the structured use of assistive technologies is built. Understanding these aspects is essential, as they directly shape their attitude, confidence, and willingness to structurally apply these technologies in practice. This will not only provide a better understanding of their attitude towards these tools but also offer insight into whether their involvement influences the overall engagement with assistive technologies. To achieve this, semi-structured interviews were conducted with care professionals working directly with clients. This resulted in an in-depth exploration of their experiences, challenges, and attitudes. The insights gained from these interviews directly contribute to identifying potential opportunities to improve care quality.

5.3.1 Preparing for the interviews

One of the supporting employees mentioned little use of assistive tools and the conversations during the initial observations indicated similar attitudes, therefore the hypothesis is that the general mindset of the care professionals regarding assistive technologies is not as positive as the previously mentioned research suggests. The assumption was made that the limited use of assistive technologies by the care professionals is the result of two possible barriers working together. Learning about assistive technologies could be a barrier that care professionals struggle to overcome. Using the assistive technologies themselves could be a separate, but highly connected barrier. Both of these could influence the implementation of assistive technologies.

To prepare for the interviews, I made an overview of the possible barriers (Figure 29). The figure shows possible barriers for both aspects and their overlapping motivations. The barriers in this overview were defined based on assumptions following from the observations, conversations, and the researcher's own reflection. This overview was then used to develop the interview guide by translating the two barriers into interview topics and questions. Semi-structured interviews were chosen for this qualitative approach, as this would provide the same basis of questions but still allow for improvised questions when needed.

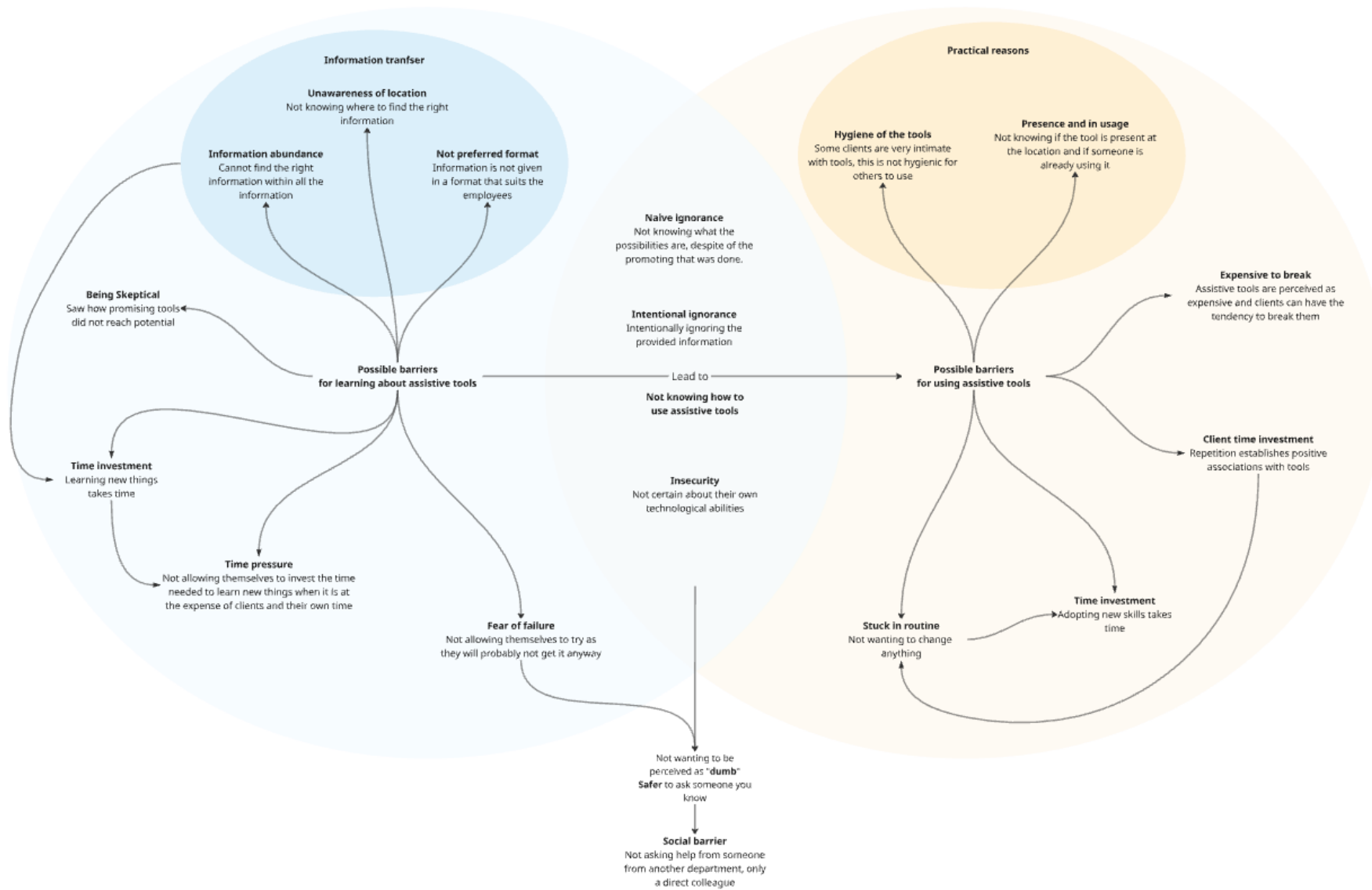


Figure 29. An overview of the 2 barriers, how they are connected and their possible underlying reasons.

5.3.2 Set-up of the interviews

The interview was aimed at gaining insights into why the use of assistive technologies is limited among care professionals working at Visio. A semi-structured approach was used, and a list of questions (Appendix D) was prepared to provide a baseline for the conversations. When interesting remarks came up, spontaneous follow-up questions were asked to make the most of the interviews.

Prior to the interviews, participants were sent a consent form in which they gave permission to record the conversation. All three participants are Visio employees, working at various locations and with varying degrees of affinity for technology. A short profile was created for each participant. All participants' names in this report have been changed to ensure anonymity.

The interviews were held online, using each participant's preferred video chat platform. All three interviews were conducted via Microsoft Teams and recorded using the platform's built-in functionality. The duration of the interviews was approximately 45–60 minutes. Only one interviewer (the researcher) was present during each interview.

The participants were asked some introductory questions, followed by six themes of questions. The six themes were:

- Learning about assistive tools
- Learning from direct colleagues
- Use of supportive sources
- Use in practice
- Team and organizational culture regarding technology
- Needs and ideas.

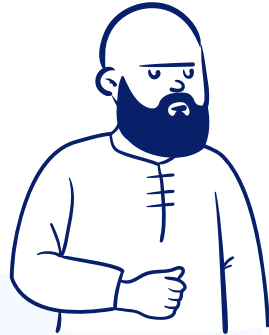
The interview was concluded with some wrapping-up questions.

The recordings were automatically transcribed by Teams. However, due to errors in these transcripts, ChatGPT was used to refine and summarize the

most relevant insights. ChatGPT was asked to read the transcripts and provide an answer to all the listed questions. The answers were structured as bullet points, followed by one relevant quote. After all the interviews were conducted and the initial answers were formulated by ChatGPT, the tool was further used to structure the findings by creating summaries per interview question, combining insights across all three interviews. ChatGPT was asked to analyse all three answers for all questions within one theme and generate a summarized overview in bullet points.

ChatGPT is not capable of differentiating between a main remark and a sidenote. Every overview generated by ChatGPT was therefore thoroughly examined by the researcher to ensure that the general meaning was converted correctly. When a generated answer focused on less relevant remarks, or when highly relevant sidenotes were missing, this was adjusted by the researcher.

5.3.3 Participants



Mark de Vries

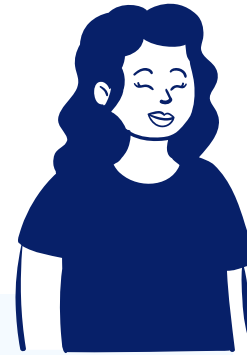
Position: Residential support worker at *De Boekenbergh* in Hoogeveen, a facility with 11 independent living apartments.

Experience: Has worked in the care sector in his current role for almost 15 years.

Specialization: Responsible for medication and involved in technological innovation within the team.

Target group: Residents with, e.g., autism, who require guidance with practical matters. The focus is on autonomy and support rather than care.

Attitude toward technology: Self-assessed score: 8/10. Describes himself as tech-savvy, curious, and often consulted by both clients and colleagues for tech-related issues. Actively explores and contributes to the implementation of suitable technological solutions.



Tessa van den Berg

Position: Group care worker at Visio De Brink (Vries), a residential facility for people with severe multiple disabilities (EMD).

Experience: Almost 25 years at Visio; currently also works for *Digidoen*.

Background: Previously worked education. Has a daughter with visual impairment, which influenced her perspective on assistive needs.

Target group: Clients with severe multiple disabilities, who are easily overstimulated and have limited cognitive and physical abilities. Including aging clients and individuals with challenging behavior.

Attitude toward technology: Self-assessed score of 7/10. Describes herself as eager to learn and curious. Sees great value in technology for both clients and staff, but expresses concern about technology replacing for human care.



Julia de wit

Position: Daycare support worker at Visio, working in the “ambachten” (crafts) cluster.

Experience: Has worked at Visio for almost 25 years, primarily in creative day programs.

Specialization: Focused on creative, hands-on activities (weaving, crafts, hoorspelen). Works both one-on-one and with groups.

Target group: Clients aged roughly 25–80 years, all visually impaired (many fully blind) with varied intellectual abilities and autism.

Attitude toward technology: Self-assessed score: 3–4/10. Feels insecure and hesitant with technology, particularly with unfamiliar tools. Prefers physical, creative activities over digital ones. Uses technology only when guided by enthusiastic colleagues. Is limited by fear of making mistakes and a lack of a tech-oriented culture in her immediate team.

5.3.4 Insights from the interviews

In this section, the insights gathered during the interviews are presented. For each topic that was addressed during the conversation, the key findings are first summarized in bullet points. This structured overview provides a clear and concise representation of the main takeaways. Following the summaries, each topic will be discussed in greater depth, allowing for a more detailed interpretation and reflection on the insights obtained. All of the findings in this section are based on the insights of the interviews and the overview per theme generated by ChatGPT.

Overview of the insights

Learning about assistive tools



- Learning about assistive technologies mainly happens individually, with little structure or support.
- Visio does not actively support practical, collaborative learning.

Learning from direct colleagues



Despite a preference for collaborative, practice-oriented learning, this approach is absent in relation to assistive technologies.

Use of supporting resources



Visio's existing resources and knowledge platforms fail to connect with employees, resulting in limited use and impact.

Use of assistive technologies



The adoption of assistive technologies depends on individual motivation and contextual factors, while limited time, costs, and lack of support slow down broader implementation.

Team- and organizational culture regarding technology



The use and development of assistive technologies rely on individual initiative, as structural attention and promotion within teams and the organization are lacking.

Needs and ideas



- Personal contact and collaborative learning are essential.
- Enthusiasm and broad support determine success of implementation.
- Limited knowledge and support.
- Visio must be an active facilitator.

In-depth discussion of the insights

Learning about assistive tools

- **Learning** about assistive tools mostly occurs **informally** and **individually**, through experimenting, using manuals or the internet, or transferring the task to a colleague.
- Employees require **practical** and **collaborative learning** with directions and direct implementation.
- **Shared learning** provides **confidence** and **motivation**, while individual learning leads to frustration or quitting.
- Visio provides **little training** or **structured knowledge sharing**. Employees mostly stumble upon new information.
- Visio needs to provide **active support** by means of regular updates, live demonstrations and information coordinated for specific target groups.

During the interviews, it became evident that employees currently learn about assistive technologies primarily by individually searching for information and experimenting on their own. Two participants mentioned relying on external sources such as manuals, YouTube, and ChatGPT to acquire the necessary knowledge before starting to experiment with the technology. However, these cases appear to be exceptions, as most employees do not engage in such self-directed learning. As the following topic will show, the preferred method of learning is through support from colleagues or training in a small group. When it comes to assistive technologies, however, this does not occur.

Previous research has shown that Visio attempts to promote assistive technologies mainly through digital channels. The interviews suggest that these efforts fail to reach employees effectively. This is the result of two elements. This can be attributed to the fact that digital formats do not align with employees' preferred ways of learning and at the same time they often lack the time to engage with such material.

Participants unanimously emphasized the need for practical and collaborative learning opportunities. One example was provided by Tessa, who described the enthusiastic response when several assistive technologies were demonstrated at a summer market at her location. However, this was not a structural intervention, but a one-time initiative at her location with only a few products available for experimentation. Other participants could not recall similar learning opportunities offered by Visio.

According to the participants, more systematic, practical, and collaborative learning practices would increase employees' confidence and motivation to implement assistive technologies in their daily work. Currently, the individual approach often leads to frustration, which results in demotivation or even giving up on experimenting with a new tool altogether. Several participants mentioned that simply having "an extra pair of eyes" would already provide the necessary support.

All participants indicated that Visio offers very limited training or other structured opportunities for knowledge sharing. As a result, learning is largely left to the initiative of intrinsically motivated employees. However, since only a few employees feel this intrinsic motivation, the majority refrain from learning about assistive technologies altogether due to the lack of support. All participants agreed that a more active support approach from Visio would help improve the current situation. Regular live demonstrations, supported group experimentations or training were mentioned as part of this active approach.

Learning from direct colleagues

- Learning moments occur mostly **spontaneously** and **informally** during work
- Colleagues are important because of the **confidence, safety** and **shared knowledge** of the target group
- Preference for **real-life practice** and **shared training** over theoretic or online information gathering
- Technology is **not shared**. Questions are shifted to a tech-savvy colleague and not used as a collaborative opportunity.
- The learning culture is about how to **provide better care**, technology is not seen as a part of this.

All interview participants emphasized a hands-on, practical, and shared learning approach when it comes to the general care of clients. This approach is preferred because colleagues are familiar with the client group and understand their needs, making them the fastest source of targeted information and experience. According to the participants, such learning moments mostly occur during spontaneous discussions at work or during breaks. A colleague can often provide a fresh perspective when someone feels stuck or frustrated.

Julia explained that collaboration is more interactive than individually searching for information. Working on a situation together creates reciprocity, action, and reaction, which makes it easier to develop new skills in a playful and natural way. Observing and imitating colleagues is also part of the learning process. Both Tessa and Julia noted that enthusiasm can be contagious, as one colleague's excitement about something new often inspires others to follow.

However, when it comes to technological tools, this process breaks down. As mentioned earlier, Visio does not provide shared learning opportunities. At the same time, the natural process of spontaneous and informal peer-to-peer exchange also does not take place when frustrations arise with technology. Instead, such problems are usually handed over to colleagues who are more technologically inclined. This shows that the current learning culture at Visio locations is primarily focused on improving general client care. Assistive technology, by contrast, is not perceived as an integral part of this care.

Using of supporting resources

- Use of SoVisio or Kennisportaal is **limited** and **incidental**. Use of the platforms is out obligation or acute problems.
- Consulting these platforms is experienced as **cumbersome, time-consuming** and **demotivating**.
- **Time, motivation** and **work pressure** create barriers for usage. Employees will choose colleagues, manuals or external resources over the internal platforms.
- Digicoaches and Zorg & Technologie are **known concepts** but **barely mentioned** as a source for technological information or advice. They are approached only in case of concrete technological problems. However, active use or structural collaboration is missing.

The use of Visio's online resources appears to be limited and largely incidental. Several employees indicated that these platforms are primarily consulted when required, for example for mandatory e-learning, or when a highly specific problem arises.

Perceptions of SoVisio varied among interview participants. While some employees, like Tessa, who are more familiar with assistive technologies, appeared more accustomed to using internal resources, the majority reported barriers such as a lack of time during shifts to explore the available materials. For some employees, even checking their mail was considered too time-consuming. Not only due to the limited time available, but also because of the large number of emails being distributed.

Others expressed a preference for external sources, such as Google, YouTube, or AI-based tools. These sources are perceived as more efficient

and user-friendly. Although the information on Visio's internal platforms was considered relevant, the process of locating it was described as cumbersome and time-consuming. Overall, SoVisio is generally consulted only when deemed strictly necessary.

The Digicoaches and Zorg & Technologie were generally familiar to the participants. However, these sources are typically consulted only when a concrete technological problem arises. Most participants indicated that they prefer to experiment on their own rather than seek support, largely due to unfamiliarity with what these sources can and cannot offer. As a result, they are uncertain about which types of difficulties could be appropriately addressed with them. Furthermore, several participants noted that addressing technological challenges is not formally part of their job responsibilities. Such activities mostly take place in their own spare time, which limits their motivation to engage. Consequently, active use of, or structural collaboration with, these sources appear to be lacking.

Use of assistive technologies

- Usage of assistive tools **differs per person** and **target group**. Only the intrinsically motivated try to use assistive technology when possible. Most barely use it or even avoid usage.
- Engagement with technology depends on the **compatibility** with the **clients'** level of understanding and individual needs.
- Adaptation is slow due to **lack of time, expenses, support** and **knowledge sharing** and relies heavily on eager individuals.
- **Motivation** and **openness** of colleagues determine the implementation of assistive tools. Scepticism, fear of failure and generational differences slow down adaptation.

The usage of assistive technology depends on multiple aspects. The adaptation and implementation of these technologies rely heavily on the motivation of employees. Only a few intrinsically motivated employees attempt to implement assistive technologies in their workflow, while the majority hesitate or even refrain from using these tools. This reluctance results from limited time to become acquainted with the technology, fear of damaging expensive equipment, and a learning culture that does not align with preferred learning methods.

Another aspect slowing the implementation of assistive technologies is their compatibility with clients' individual needs and levels of understanding. Two participants mentioned having seen promotion of assistive technologies, but noted that their clients were not suitable recipients. For one participant, the clients would not have been sufficiently engaged by the promoted technologies, while for another, the clients would not have been able to interact with them.

When discussing the workday with the participants, none reported a structural use of assistive technologies. According to them, this is due to the individual needs of the clients. While one client might benefit from technologies that enable some interaction, another could become overstimulated simply by being in the same room, and on another day the situation could be reversed. This all demonstrates not only the difficulty of deploying the same technologies across different client groups, but also of applying them consistently with the same clients.

This illustrates both the need for assistive tools tailored to individual needs, and the fact that promotional efforts often reach employees who are unlikely to benefit from them. This results in unwanted information that only adds to the already considerable workload of employees.

The final factor influencing implementation is the attitude of employees. The motivation, openness, and enthusiasm of colleagues can facilitate adaptation by positively affecting more sceptical care professionals and reducing fear of failure. Participants reported that they were more inclined to experiment with and implement new assistive technologies when these were introduced by an enthusiastic colleague. Observing a colleague successfully applying the technologies can lower barriers, as it creates the perception that “if they can do it, I can do it too.” Furthermore, age was mentioned as another factor contributing to resistance. According to the participants, the older an employee, the less likely they were to be open to new technologies.

Team- and organizational culture regarding technology

- Technology is **scarcely addressed** in team(meetings) or promoted by the organization. Utilization and knowledge sharing largely rely on individual initiative.
- Only **intrinsically motivated** employees actively delve into technology. The majority feels little responsibility or urgency.
- In practice, the Digicoaches and Zorg & Technologie are not **visible** or **accessible** enough.
- Daycare is more **open** and **experimental** towards assistive technologies, while residential care is more **conservative** and mainly care-focused.

In general, assistive technologies are rarely discussed within teams or in the broader organizational culture. Among colleagues, technology is scarcely addressed. When difficulties with technological tools arise, employees tend to rely on more tech-savvy colleagues to resolve them. These highly motivated individuals are the ones who take the time to familiarize themselves with the materials. However, the majority of employees do not share this motivation and do not consider the adoption of technological tools part of their workload or responsibility. Experimentation with new technologies is rare, and the implementation of technological tools is not actively encouraged.

Although Zorg & Technologie is engaged in promoting assistive technologies, participants reported limited support in practice. Two participants even noted that they had never received a demonstration of the available tools. According to the participants, structural support is lacking, suggesting that

Visio's promotional efforts are not effectively reaching employees.

All participants further indicated that a clear point of contact within the teams is missing. While Digidoen encourages employees to take on this role, the combination of limited motivation and an increased workload without compensation means that the position remains vacant.

When it comes to providing technological support, Zorg & Technologie and the Digicoaches are, according to participants, insufficiently visible because no structurally accessible support is in place. As noted earlier, employees are aware that these resources exist but experience a barrier to contacting them, expressing a preference for more personal contact.

Lastly, one participant observed a difference in mentality between employees working at the daycare facility and those at the residential care facility. According to this participant, daycare employees appeared more open to experimenting with new assistive technologies. Because their work focuses on engaging and entertaining clients throughout the day, they are more inclined to implement technological tools compared to residential care employees, whose primary focus is on providing essential care. While this is a valuable observation, it was only mentioned by a single participant. Further research would therefore be needed to determine whether this difference also occurs at other locations.

Needs and ideas

To gain insight into potential improvements, participants were asked about their needs concerning the implementation of assistive technologies, the accessibility of information, and preferred forms of support. The following is a summary of their responses.

- **Personal contact and collaborative learning are essential.**
Employees want hands-on experience, in small groups, preferably with clients. Verbal explanation and physical presence of the assistive technology have a better success rate than manuals or digital instructions.
- **Enthusiasm and broad support determine success of implementation.**
Assistive technologies will only be implemented when the employees are enthusiastic about it. Having fun and positive experiences for the clients will increase the motivation.
- **Limited knowledge and support.**
Most employees are not aware of the possibilities or how to start. Limited structured support or accessible knowledge is provided within the organization.
- **Visio must be an active facilitator.**
Instead of only providing assistive tools, there is a need for:
 - Practical explanation and on-the-job guidance
 - Room to experiment without pressure
 - Examples and inspiration from within the organization

5.4 Identified concept direction 3: Encouraging the implementation of assistive technologies

The previous sections described several issues and their consequences experienced by the care professionals working directly with clients with both a visual and intellectual disability. The insights gathered during the interviews show there is room to improve the current situation regarding assistive technologies.

Contrary to the previously mentioned concept directions, which primarily resulted in potential product-based solutions, the insights derived from this chapter require a different approach. The identified challenges that the care professionals experience cannot be addressed by a single solution. The complexity of this type of problem requires a set of interventions.

Design goal: Design a set of interventions that supports Visio care professionals in gaining and using practical knowledge about assistive technology for clients with visual and intellectual disabilities.

The interviews revealed a clear mismatch between the learning preferences of care professionals and the current formats used by Visio to share knowledge about assistive technology. Most of the learning currently happens individually and informally, with little structure, collaboration, or guidance. Existing platforms and resources are rarely used, not because the content is irrelevant, but because the format does not engage or connect to daily practice. As a result, essential information often fails to reach or engage the intended audience.

The successful adoption of assistive technologies depends greatly on individual motivation and contextual factors. Enthusiasm, peer influence, and practical examples determine whether care professionals apply new

tools, while limited time, costs, and the absence of facilitation slow down broader implementation. These insights indicate that the challenges are not merely about information access, but span across learning, motivation, collaboration, and organizational facilitation. Therefore, this concept direction will focus on identifying learning formats that effectively work for care professionals. This direction will explore and design formats and interventions that align with their learning preferences, needs, and workflows.

These interventions may include learning formats, peer-support structures, facilitation tools, or organizational practices that help create an environment where assistive technologies are understood, shared, applied, and sustained in daily work. Rather than merely providing resources, Visio must actively foster a culture of practical learning, collaboration, and implementation.

Unlike the previous two concept directions, I have not yet defined a concrete solution to the problem at hand. This concept direction is much more abstract, needing multiple interventions to strengthen practical knowledge, collaborative learning, and organizational support. Therefore, this elaboration of the concept direction does not provide the same level of detail as the previously stated concept directions, as it focuses on defining multiple, interconnected interventions rather than one defined product solution.

5.5 Synthesis of care professionals' insights and concept direction

In this chapter, research was conducted into how care professionals learn about and use assistive technologies. The proposed direction translates the discovered insights into a concept direction that focuses on designing interventions that align with the learning preferences of the care professionals. The interviews indicate several instances where the current learning situation does not match the preferences of the care professionals. This results in limited knowledge acquisition and implementation of assistive technologies in daily work practices. The identified concept direction proposes focusing on care professionals to identify a set of interventions that fit their learning style.

However, this concept direction does not provide the same level of details as the earlier proposed directions. This is because the set of interventions must be designed entirely according to the preferences of the care professionals. Further exploration is required to identify these preferences.

The success of these interventions depends heavily on listening to and incorporating the preferences of the care professionals. Therefore, involving them in designing the interventions is necessary. With their assistance, the best-fitting interventions can be selected.

The insights in this chapter reflect the perspective of care professionals. These insights create a meaningful foundation for developing solutions that are relevant, feasible and likely to be supported by the care professionals themselves. Where earlier studies indicated strong enthusiasm among professionals, this now appears partly tied to how the questions were asked. The interviews reveal a more cautious and nuanced attitude.

The interviews offered a more authentic and detailed perspective on how care professionals actually perceive and use assistive technologies.

Together with the earlier findings from the clients and Zorg & Technologie, they provide a complete overview of the various stakeholder needs and expectations. In the next chapter, these perspectives will be compared to determine which stakeholder group and concept direction offer the most promising starting point.

6. Selecting the design focus

In this chapter, the focus shifts from the broader exploration of all stakeholders to selecting the design focus of this project. In section 6.1, all the previously analysed stakeholders are discussed. By analysing the impact each stakeholder has on the context of assistive technologies, the care professional is chosen as this project's key stakeholder. Section 6.2 provides a deeper analysis of the main problem, as well as the causes and consequences of the limited use of assistive technologies among care professionals.

Based on this main problem, section 6.3 formulates the design goal, criteria, and scope of this project. Section 6.4 concludes this chapter by synthesizing the key insights from the stakeholder analysis, problem exploration, and design framing. This synthesis forms a coherent basis for the development process that follows.

6.1 How the insights point toward one stakeholder

In the previous chapters, insights were gathered from three stakeholder groups: clients, supporters of the care professionals, and care professionals. By examining these stakeholders, it became possible to understand how assistive technologies are currently being used within Visio, where the main challenges lie, and which opportunities may exist to improve both the use of assistive technology and overall care quality. Their experiences, obstacles, and needs were investigated to answer the following question:

“How do clients, supporters, and professionals within Visio engage with assistive technologies, and what does this reveal about opportunities to improve care quality?”

The first stakeholder examined in this study was the clients at Visio De Blauwe Kamer. The main takeaway from this part of the research is that many existing assistive technologies are not well-suited to the abilities and characteristics of this client group. Several of the technologies currently in use were not originally designed for people with multiple and severe disabilities. This mismatch may help explain why the use of assistive technologies is often limited and inconsistent.

Next, the focus shifted to the supporters of the care professionals, Zorg & Technologie. After examining the Kennisportaal, several issues were revealed that make identifying the right information about assistive technologies cumbersome and inefficient. It is challenging to distinguish the necessary information because many articles contain unnecessary, abundant, and poorly structured content. This challenging information format may contribute to the lack of knowledge and limited use of assistive technologies among care professionals.

The final stakeholder group consisted of the care professionals themselves. Since earlier research was insufficient, qualitative interviews were conducted to gain a deeper understanding of their experiences. These interviews revealed a mismatch between the current teaching materials on assistive technologies and the learning preferences of the care professionals. The limited acquisition of knowledge and the inconsistent implementation of assistive technologies in daily work practices may be the result of this mismatch.

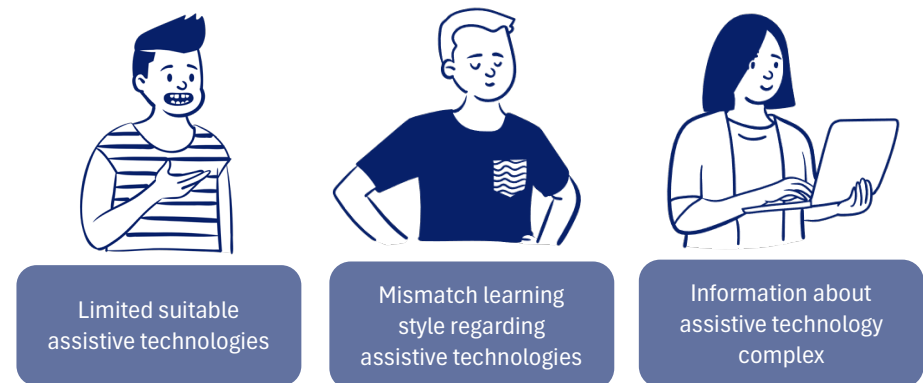


Figure 30. Stakeholder challenges regarding assistive technologies

Taken together, these insights show that each stakeholder group faces challenges and opportunities regarding the implementation of assistive technologies (Figure 30). The clients could greatly benefit from assistive technologies specifically designed for them. However, it is up to the care professionals to initiate interaction and if they do not feel confident enough, this step will not be taken. The supporters could improve the accessibility of their online information sources about assistive technologies. However, if the care professionals do not utilize these sources, the knowledge will still not reach the intended reader. In the process of introducing and implementing more assistive technologies, the care professionals are therefore identified as the key stakeholders (Figure 31).

Although the limited availability of assistive technologies designed for this client group is a compelling issue, prioritizing this challenge within this project would likely have a limited impact. Even if new or improved technological solutions were developed specifically for this client group, their impact would remain limited as long as care professionals do not feel adequately prepared or supported to use them. Reducing the barriers encountered by care professionals would therefore be essential for ensuring that future advancements in technology can be successfully implemented in practice.

While the supporters play a relevant role in creating and maintaining accessible knowledge resources, their efforts can only translate into

practical improvements when care professionals actively engage with these materials. The supporters will still remain important in the continuation of this project, as they are responsible for bringing information about assistive technologies to the care professionals. To fulfil this role effectively, their approach to communication and knowledge transfer will need to be adjusted to better align with the learning preferences of the care professionals. This further emphasizes the central position of the care professionals in the implementation process, while also highlighting the need for supporters of the care professionals to adapt their strategies accordingly.

In conclusion, focusing on the engagement of the care professionals with assistive technologies will have the biggest impact on improving the quality of care (Figure 31). The care professionals have the greatest influence on whether assistive technologies are actually used in practice. They are the ones who determine when and how these tools are introduced to clients. They also experience the largest number of barriers, ranging from limited confidence and negative past experiences to a lack of time and insufficiently aligned learning materials. They also work directly within the environments where assistive technologies are applied, which means their actions have an immediate impact on clients. Because of this central position, improving their engagement will support their professional development and increase the likelihood that clients benefit from assistive technologies. It will also help the supporters of the care professionals ensure that their knowledge and resources reach the intended audience. As a result, focusing on this group is expected to generate the greatest overall impact across all stakeholders involved.

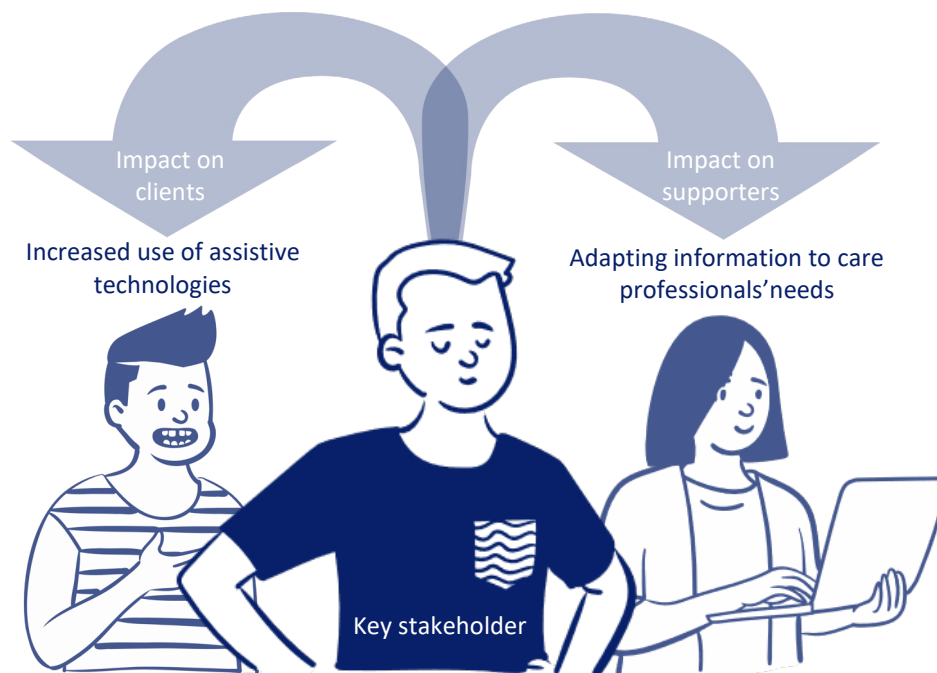


Figure 31. The central role of care professionals and their impact on clients and supporters.

6.2 Problem analysis and identification of the core issue

With the care professionals identified as the key stakeholder group, it becomes necessary to gain a deeper understanding of the underlying problem before moving forward. To do so, the insights from the earlier interviews are examined more closely to uncover where the core issues originate and how they manifest in practice. This deeper exploration also focuses on identifying the causes and consequences of the limited engagement with assistive technologies. To structure these findings, all relevant relationships were mapped out, eventually leading to a visual representation of the key problem areas. The key problem areas are represented visually in Figure 32.

6.2.1 Main problem: Absence of shared learning environment for assistive technologies

All participants expressed a preference for group learning and learning from direct colleagues. Group learning enables interaction, shared experimentation, and opportunities for mutual learning. Learning from direct colleagues provides a safe space, shared experience and knowledge about the clients and empathy for the situation.

Despite this strong preference and the participants' emphasis on the importance of such forms of knowledge sharing, this approach appears to be absent when it comes to assistive technologies. This seems to represent the core problem: in the context of assistive technologies, the shared learning environment is absent.

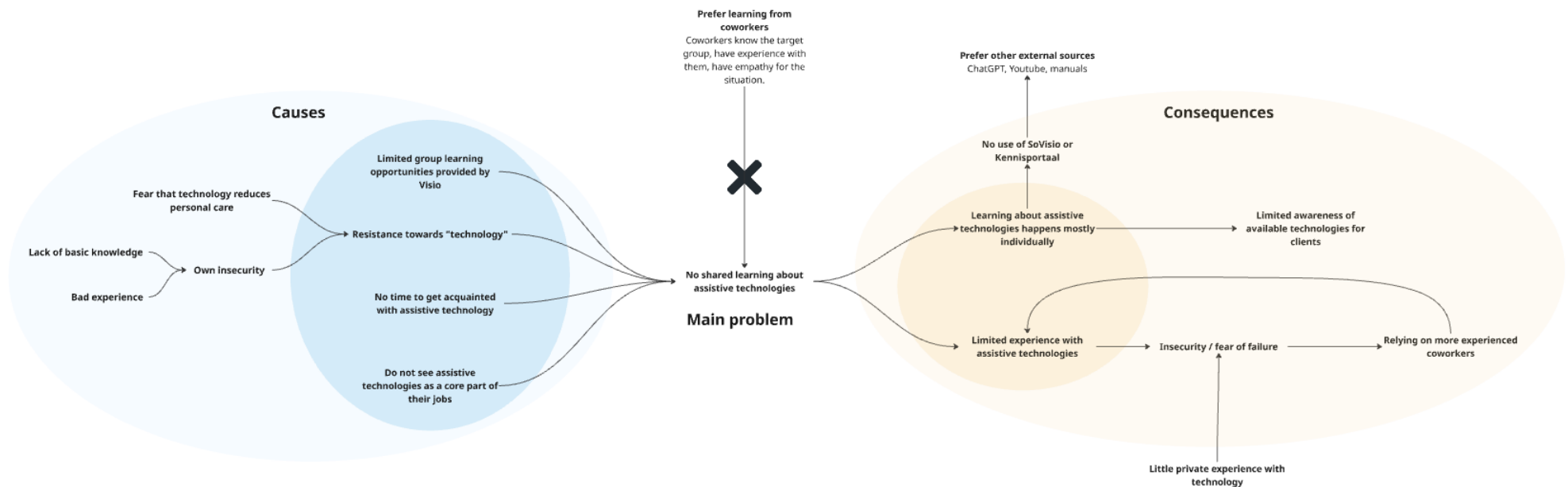


Figure 32. An overview of the main problem, the causes (blue) and the consequences (yellow). The most important causes and consequences are presented in the smaller bubbles.

6.2.2 Underlying causes of the absent shared learning environment

This absent shared learning environment regarding assistive technologies are the result of four identified causes: Limited group learning opportunities provided by Visio, resistance towards "technology", a lack of time to become familiar with assistive technology and the perception that these technologies are not a core part of their jobs.

While causes such as limited group learning opportunities, insufficient time to become familiar with assistive technologies, and the perception that assistive technologies are not a core part of one's work are largely self-explanatory, the cause resistance towards technology requires further elaboration. This particular issue appears to be the result of several underlying factors.

One major contributing factor is the fear that assistive technologies might replace personal care. Care professionals are concerned that such technologies will be used as substitutes for the quality time they spend with clients, rather than as tools that enrich clients' lives or provide meaningful engagement when direct personal care is not possible.

Another contributing factor is the care professionals' sense of insecurity. This insecurity often originates from a lack of personal experience with technology. Many care professionals make limited use of digital tools in their daily lives and therefore lack the basic knowledge needed to confidently engage with similar technologies in their professional practice. In addition, many have had negative experiences with assistive technologies in the past, which has led to fear and demotivation to try again. This further reinforces their sense of insecurity.

6.2.3 Consequences of the absent shared learning environment

The main consequences of the absence of a shared learning environment for assistive technologies are the predominance of individual learning and the resulting limited experience with these tools. Due to the current individual learning environment, care professionals must independently search for suitable assistive technologies. Because they have limited time, resources, and experience, this often results in a lack of awareness of which technologies are available for their clients.

SoVisio and Kennisportaal are experienced as too cumbersome and time-consuming. When care professionals conduct their own research into suitable assistive technologies, they tend to avoid using these internal platforms, even though they acknowledge that these sources are likely to contain valuable information. Accessing these resources requires care professionals to already have a clear idea of what they are looking for. However, in most cases, they are still exploring and are seeking information that can guide them in the right direction. As a result, they tend to rely on external sources such as Google, YouTube, or AI-based tools, as these can provide a more accessible and immediate overview.

The limited experience with assistive technologies often causes feelings of insecurity and fear of making mistakes. This inexperience increases their worry about doing something incorrectly or making crucial mistakes, particularly when it concerns tools they believe should already be understood or that are perceived as simple. This insecurity is enhanced by the limited personal experience most care professionals have with technology. As a result, they tend to rely on colleagues who are more confident or experienced with technology rather than engaging with the tools themselves. This behaviour maintains their lack of experience and contributes to a cycle of insecurity and avoidance.

6.3 Defining the design goal and scope

With the core problem established as the absence of a shared learning environment, the next step will be to adjust the previously stated design goal to this newly identified problem. Addressing this issue will not only influence the engagement of care professionals with assistive technologies but will also benefit the clients and the supporters of the care professionals. The previous section showed the complexity of the core problem, as it consists of social, organizational, and technological barriers. Because of this complexity, a single solution will not be sufficient. Instead, a set of interventions is needed to target multiple underlying causes, including resistance towards technologies, a lack of shared learning opportunities provided by Visio, insufficient time, and not seeing assistive technologies as part of their job.

Therefore, the interventions must facilitate several key elements. First, they should facilitate collaboration, group learning, and peer-to-peer knowledge sharing. When the interventions involve technology, this should be accessible, low-threshold, and easy to experiment with. Third, the interventions also need to align with the learning preferences of care professionals. The proposed interventions need to be practical, social, and experience-based rather than theory-driven. Finally, they should fit within the work context. The interventions will need to acknowledge time constraints and the need for hands-on, relevant, and directly applicable learning experiences.

These elements form the design criteria that guide the development of suitable interventions. Based on these criteria, the design goal was reformulated as follows:

To design a set of interventions that foster a shared learning culture in which Visio care professionals can collaboratively explore, practice, and exchange experiences with assistive technologies.

This reformulated design goal shifts the focus from providing knowledge about assistive technologies to creating a learning environment where professionals can explore these technologies together. The aim of this design goal is not just to improve the understanding of assistive technologies, but to help the care professionals in building confidence and feeling supported in using them. When learning takes place in a safe and collaborative setting, professionals are more likely to experiment, share both successes and failures, and gradually integrate these technologies into their work routines. Instead of focusing only on what they should learn, this goal focuses on how they learn best: through social interaction, real-life examples, and practical experience. This increases the chance that assistive technologies will not only be understood, but will actually be used in practice.

While this design goal focuses on the broader cultural and social dimensions of learning, the scope of this project remains on developing practical and feasible interventions that can be applied within the daily work context of Visio care professionals. The aim is not to redesign organizational structures or introduce new training policies, but to explore small-scale, accessible interventions that can be used in the daily routines of care professionals. The focus is specifically on professionals working in residential and day-care settings at Visio, and not on managers, trainers, or other stakeholder groups. By keeping the focus close to their daily work context, the interventions can genuinely support learning, reflection, and shared experimentation with assistive technologies.

These design criteria and the reformulated design goal serve as the foundation for the next steps of the project. They guide the development of ideas and interventions that aim to create a more collaborative, practical, and supportive learning environment around assistive technologies.

6.4 Synthesis of findings: creating the conditions for shared learning

The core problem in this chapter is identified as the absence of a shared learning environment among care professionals of Visio regarding assistive technologies. The main causes for this problem are negativity towards technologies, limited shared learning opportunities provided by Visio, a lack of time, and not considering assistive technologies as part of their job. The focus on the care professionals is chosen because their engagement with assistive technologies also impacts on the clients and the supporters of the care professionals. Care professionals are the ones implementing assistive technologies in daily practice, and therefore, their skills and attitudes determine the quality and effectiveness of technology use for clients. Additionally, supporters must adjust their materials and interventions to the needs of care professionals, placing this group at the center of the problem analysis.

By focusing on this problem, the interventions can have a meaningful impact, as they directly address the everyday learning practices of the professionals who decide whether assistive technologies are actually used in client care. These insights form the foundation of the design phase, ensuring that the interventions are both relevant and realistically applicable within the Visio context.

The conducted interviews and the analysis of the core problem convey the need for accessible, collaborative, practical and contextual learning opportunities. To solve an issue of this complexity, a set of interventions is needed to address multiple underlying causes and create supportive learning conditions.

Based on the analysis of the core problem, the design goal was defined as follows:

To design a set of interventions that foster a shared learning culture in which Visio care professionals can collaboratively explore, practice, and exchange experiences with assistive technologies.

To support this design goal, the following design criteria have been established for the scope of the project:

- Interventions should support collaboration, group learning, and peer-to-peer knowledge exchange.
- Interventions must match the learning preferences of care professionals.
- Interventions should fit the work environment.
- Technology should be accessible, low-threshold, and easy to experiment with.

Based on the design goal and design criteria, the next step is to develop intervention concepts aimed at fostering collaborative and practical learning for care professionals in the context of assistive technologies. Multiple concepts are explored by translating key insights into initial intervention ideas, which are subsequently refined based on feedback from care professionals. These concepts are based on the insights from this chapter, ensuring that they align with the identified needs and contextual conditions.

7. Concept development and refinement

This chapter presents the second interview conducted as part of this research direction. Building on the insights obtained from the first interview, this follow-up session focused on exploring possible interventions and further understanding the shared learning preferences of the three interviewed care professionals.

Section 7.1 describes the set-up and procedure of the second interview, including the topics were discussed. Section 7.2 presents the insights gathered from the interviews. First, an overview of key findings is presented, followed by a more detailed exploration of participants' feedback on specific concepts. Section 7.3 concludes this chapter by synthesizing the main insights and presenting the selection of interventions that will be further elaborated in the following chapter.

7.1 Set-up of the second interviews

The second interview aimed to present multiple possible interventions and gain an understanding of the shared learning preferences of the care professionals. It served as a follow-up to the previously conducted interview. The interview followed the same set-up and was conducted with the same participants. The complete list of questions used in this interview can be found in Appendix E.

First, the participants were asked about the previous interview: whether they had new comments they wanted to mention or other pressing matters to convey before starting the next interview. At this point, the researcher also mentioned the board game referenced in Chapter 5 of this report. The participants were asked whether they were aware of its existence, if they had come into contact with it, and what their opinion of the game was.

In this interview, the participants were asked about their own ideas regarding the following topics:

- Information and support
- Time and work pressure
- Doubting own abilities and fear
- Team and culture

Next, the following five concepts were presented and explained:

- Technology fest
- Technology ambassadors
- Team quiz with submitted questions
- Step-by-step learning game/app
- Concerns and Complaints Wall

Lastly, two slides with an assortment of sketches and concepts were presented. The participants were asked to comment on ideas that stood out to them, both positively and negatively. The interview concluded with some

wrapping-up questions.

The recordings of these interviews were also automatically transcribed by Microsoft Teams and subsequently analysed by ChatGPT. The same prompt was used to analyse each question as in the first interview described in Chapter 5. Finally, ChatGPT was used to combine and summarise the answers from all three participants. Once again, every overview generated by ChatGPT was thoroughly reviewed to ensure that the general meaning was correctly represented.

7.2 Insights of the second interviews

In this section, the insights gathered from the second interview are presented. In this interview, two participants shared their ideas for improving the key themes identified in the first session. Next, the five concepts and the general opinions of the participants are presented. Lastly, an overview is shown of other concepts the participants found noteworthy.

Information and support

- Need for one central platform with clear categories and compact explanations.
- Example needs to be practical and immediately usable.
- Employees need time and space to practice
- Experience based learning helps to decrease fear and insecurity.

Fear and doubt

- Accessible practice during work with the assistive tools or examples to gain confidence.
- Clear and compact explanations to make using assistive technologies less daunting and provide structure.
- Employees do not have to know everything; basic knowledge is a good start.
- Time and space are essential to practice and gain experience.

7.2.1 Participants' ideas for improvement

During the interview, two of the participants were asked to share their ideas on how the current situation could be improved regarding the following themes: Information and support, Time and work pressure, Doubting own abilities and fear, Team and culture. These themes were identified as leading topics during the first interview.

Time and work pressure

- Overview of applicable assistive tools per individual makes technology more concrete and deployable.
- Open-ended information and basic knowledge decrease pressure and provides confidence.
- Direct added value stimulates usage, but old habits die hard (especially at the residential care)

Team and culture

- Creating a safe environment in which experimenting is encouraged and confidence can grow.
- Lowering the barrier by offering technology informally and low-pressured.
- Encouraging a shared learning culture by discussing matters in team meetings.
- Behavioural scientists should incorporate technology in client meetings and create bridges between daycare and residential care.

7.2.2 Participant feedback on presented concepts

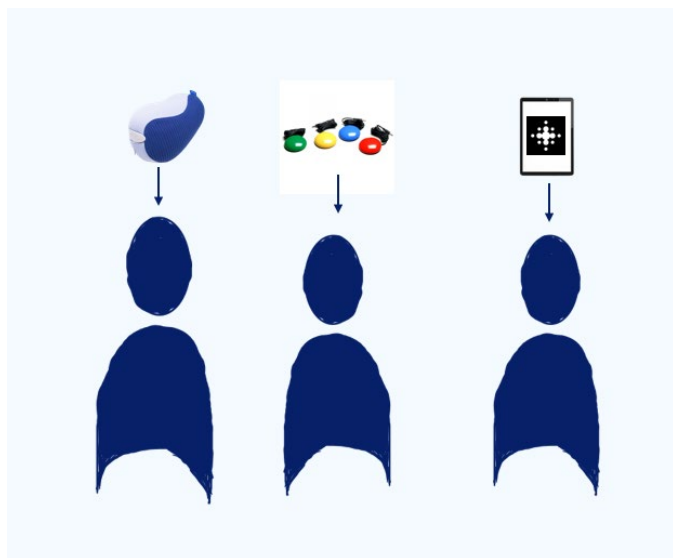
In the next part of the interview, participants were presented with sketches illustrating potential design concepts. These sketches were accompanied by a short explanation of what each idea entailed and how it could be understood in practice. Five ideas were discussed in detail, while the remaining concepts were presented more briefly in an overview, allowing participants to reflect on their relevance and potential. After presenting all the concepts, questions were asked to evaluate them. This revealed a general preference towards multiple concepts and a general dislike of others.



Technology fest

A festival or fair where care professionals, clients, and family members can explore, test, and discuss assistive technologies.

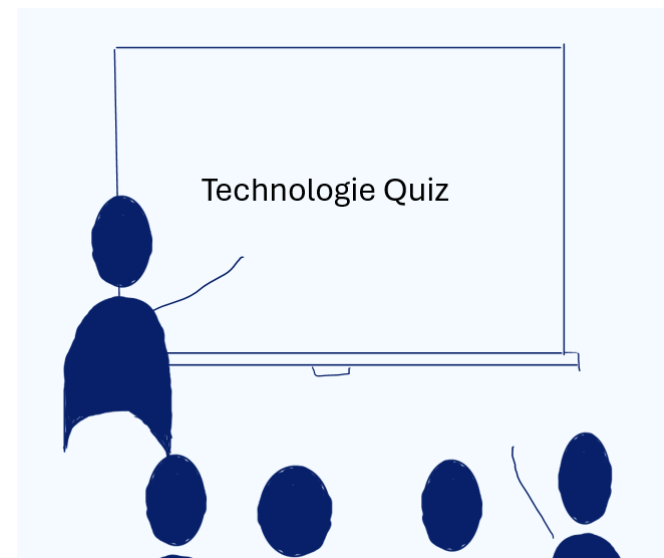
- **Positive and accessible.** This idea is perceived as promising if it has an informal, open-ended and practical character. The value lies in becoming acquainted, experiencing and experimenting together.
- **Connection and inclusion.** Success depends on adjustment to the target group and location.
- **Preconditions and continuity.** Additional staff or volunteers are needed to ensure participation. Repetition and linkage to existing initiatives and a dedicated driving force could prevent it from remaining a one-time effort.
- **Broad involvement.** Family, volunteers and behavioural scientists should be involved to help make assistive tools more discussable and self-evident.



Technology ambassadors

Staff members take responsibility for one assistive tool.

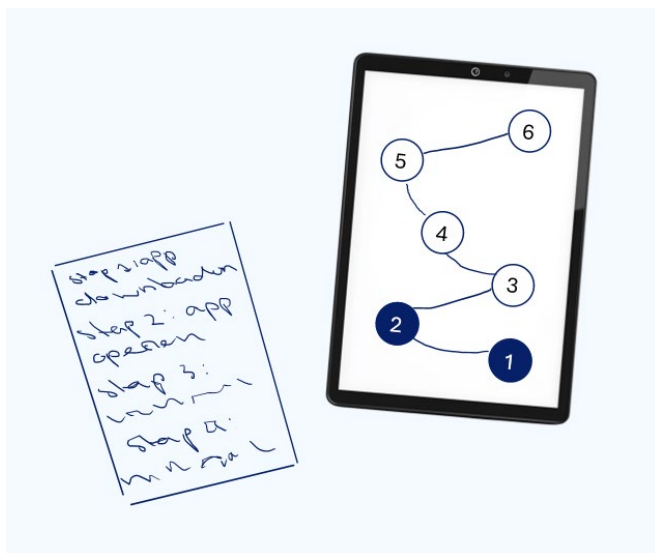
- **Divided opinions.** Reactions vary from critical to enthusiastic, all agree that motivation and enthusiasm play a key role.
- **The right ambassadors and conditions.** Select a few motivated care professionals with an affinity for technology. Provide them with time, space, and formal recognition, broaden their role to cover technology in general and embed this structurally in their work.
- **Enthusiasm and support.** Technology must resonate with both colleagues and clients to encourage its use.
- **Important barriers.** Work pressure, technological insecurity and limited tools hinder participation.



Team quiz with submitted questions

A quiz session where colleagues submit questions about technology, and the quiz is played together, for example, during a team meeting.

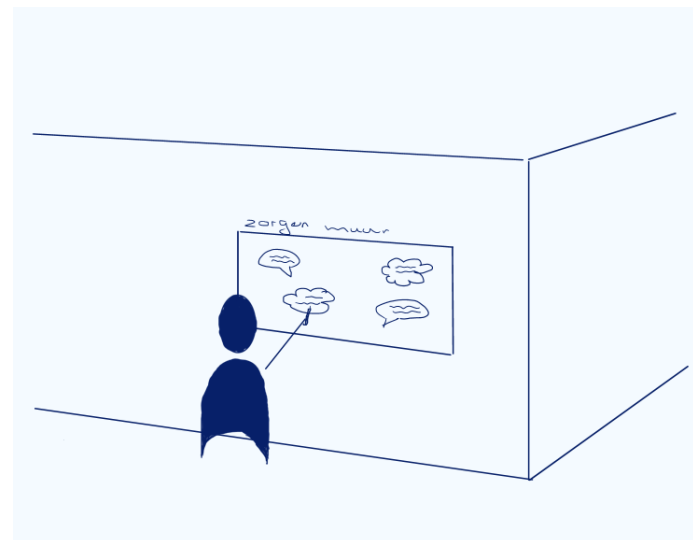
- **Fun but not self-evident.** The quiz is perceived as accessible, but it is expected that only a few colleagues will send in questions.
- **Linking to existing moments.** Adding the quiz to team meetings or theme days, provided it is relevant.
- **Follow-up actions.** Adding product experience to make it more memorable and repetition is needed.
- **Action for higher feasibility.** Prepare questions centrally, link them to practice and clients, and incorporate them into a learning process.



Step-by-step learning game/app

A learning path where care professionals can practice technical skills through a simple, step-by-step game or app.

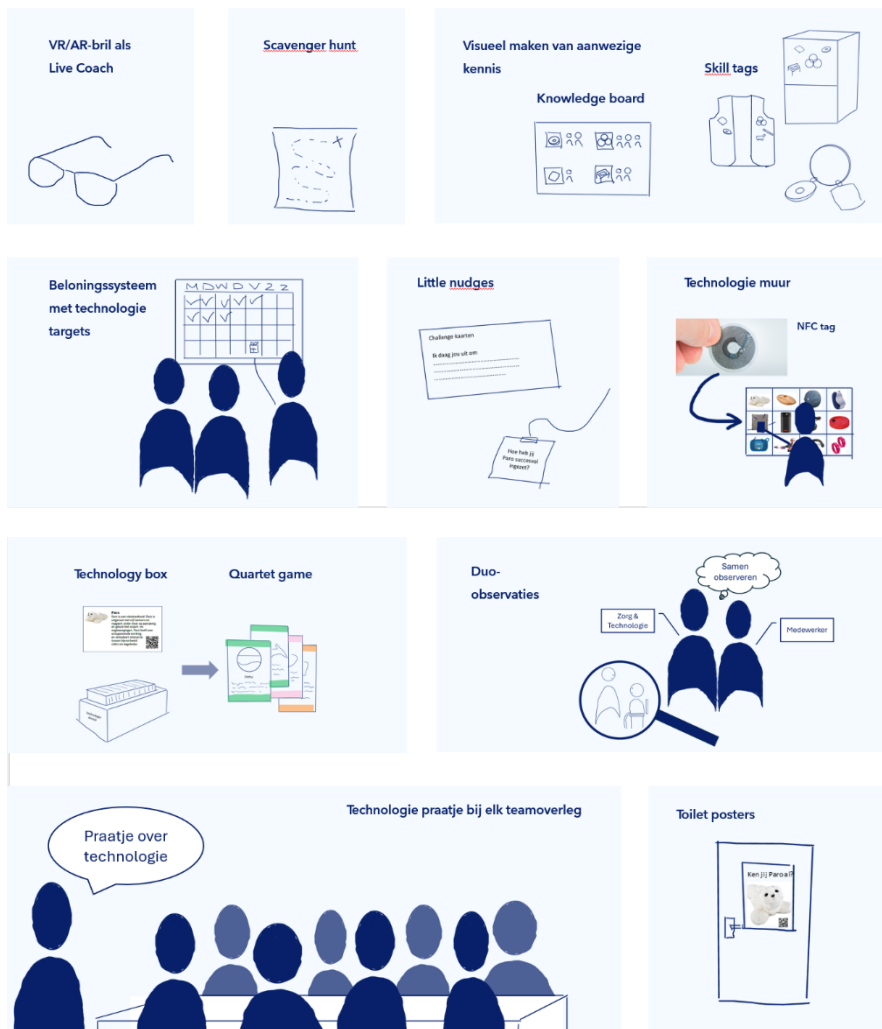
- **Accessible and playful.** Feels more like a game, not an obligation. Micro steps and little successes lower fear and boost confidence.
- **Concrete and practice-oriented.** Works when relevant for own work practice. Introduction and simple instructions are needed in team meetings.
- **Sharing the experience.** Care professionals would prefer sharing and experiencing the game together or in small groups, this would increase motivation and prevent quitting.
- **Limited time and technological hiccups.** Lack of time, motivation and basic skills. The game could become too simple or feel too complicated.
- **Choice and support.** Employees must be able to choose themes and products. The app should be short and practical, linked to specific goals and support must be offered to get started.



Concerns and Complaints Wall

A physical spot where colleagues can post their concerns, questions, or complaints about technology, such as a bulletin board in the team room.

- **Visual representation of concerns.** Makes questions and barriers concerning technology concrete and allows for open discussion.
- **Visible and opens conversation.** Physical notes are less prone to disappearing and encourage exchange.
- **Dependent on follow-up actions.** Will only work when the input is taken serious and feedback is provided.
- **Low engagement and lack of trust.** Limited interest, time constraints, uncertainty about follow-up, and challenges regarding anonymity.
- **Linking to existing moments and discussions.** Discussing the feedback within team meetings with clear explanations. Important to make one person in charge of this.



Technology talk during team meeting

Mentioned by two of the participants. Is viewed as valuable and feasible. Repetition and structural implementation is needed but not too often.

Toilet poster

Mentioned by one of the participants. Has no use for clients but is applicable to employees. Braille could enhance accessibility.

Technology box / Quartet / Game

Mentioned by all participants. Playful and pleasing when used together or in groups. Could be linked to team meetings.

Duo-observation

Mentioned by all participants. Sounds valuable in theory, but execution would be difficult (time, money, compulsory feeling). A suggestion is made for a short or one-time moment.

Reward system

Mentioned by all participants. Unanimously rejected. Seems unfair, demotivating, and evokes resistance. One participant suggests making it a team reward so success can be celebrated together.

VR-glasses

Mentioned by two participants. Enthusiasm as a playful tool, but on the other hand discomfort and fear of it becoming another gimmick.

Making existing knowledge visible / knowledge board / skill tags

Mentioned by all participants.

Very important and valuable. Provides insights into the available technological tools and how to equip yourself with the knowledge. Has to be practical and accessible.

Challenge cards

Mentioned by two participants.

Playful idea, but requires motivation.

Technology wall with NFC-tags

Mentioned by two participants.

Easy access to information, technologically feasible. Has to work practically and has to be adjusted to every location.

Scavenger hunt

Mentioned by one participant.

Fun and accessible. A game enhances the involvement and makes learning interactive.

Participants own input

One participant suggests a combination of the earlier-mentioned technology fair and making the existing knowledge visible. This requires an inventory of what is used for each target group, so each location gets a tailored technology fair. It is important to involve clients in the learning process.

Evaluation

Most positively received

- **Visual and experience-based concepts** like board/wall with NFC-tags, technology fest, and quiz. Visibility, repetition, and playful learning make technology more accessible and attractive.
- **Combination** of these concepts will make more impact than standalone interventions.

Most negatively received

- **Reward system** feels compulsory, unnatural, and unfair.
- **Practically demanding ideas** like the full observation days are considered unfeasible.

What can make a difference?

- **Structural implementation.** Technology has to be embedded into the current work processes.
- **Accessible and repetitive learning.** Small steps, playful and approachable.
- **Client involvement.** Implementing technology for the curiosity and self-reliance of the clients, not only for the employees.

Extra suggestions

- Workshops in which employees and clients explore technology together.
- Connecting interventions to existing routines and structure, such as meetings and annual evaluations.

7.3 Conclusion and selection of interventions

The goal of this chapter was to present possible interventions and gain an understanding of the shared learning preferences of the care professionals.

The interviews showed a preference for those concepts supporting accessible, team-based, practical, and low-threshold learning opportunities, which is in accordance with the insights of the previous interviews. The interviewees presented a preference for the concepts: board/wall with NFC-tags, technology fest, and quiz. Other concepts like the Technology talk and the quartet game were regarded positively but not mentioned within the evaluation. Concepts requiring additional time investment or individual responsibility were generally received less positively.

All participants expressed a preference for multiple concepts and indicated that combining several of these concepts would lead to better results. Based on these insights, a selection and combination of the most suitable concepts was made. The following chapter presents the final set of interventions. The complete set of interventions includes not only the interventions discussed in this chapter, but also interventions derived from the earlier interviews.

8. The proposed set of interventions

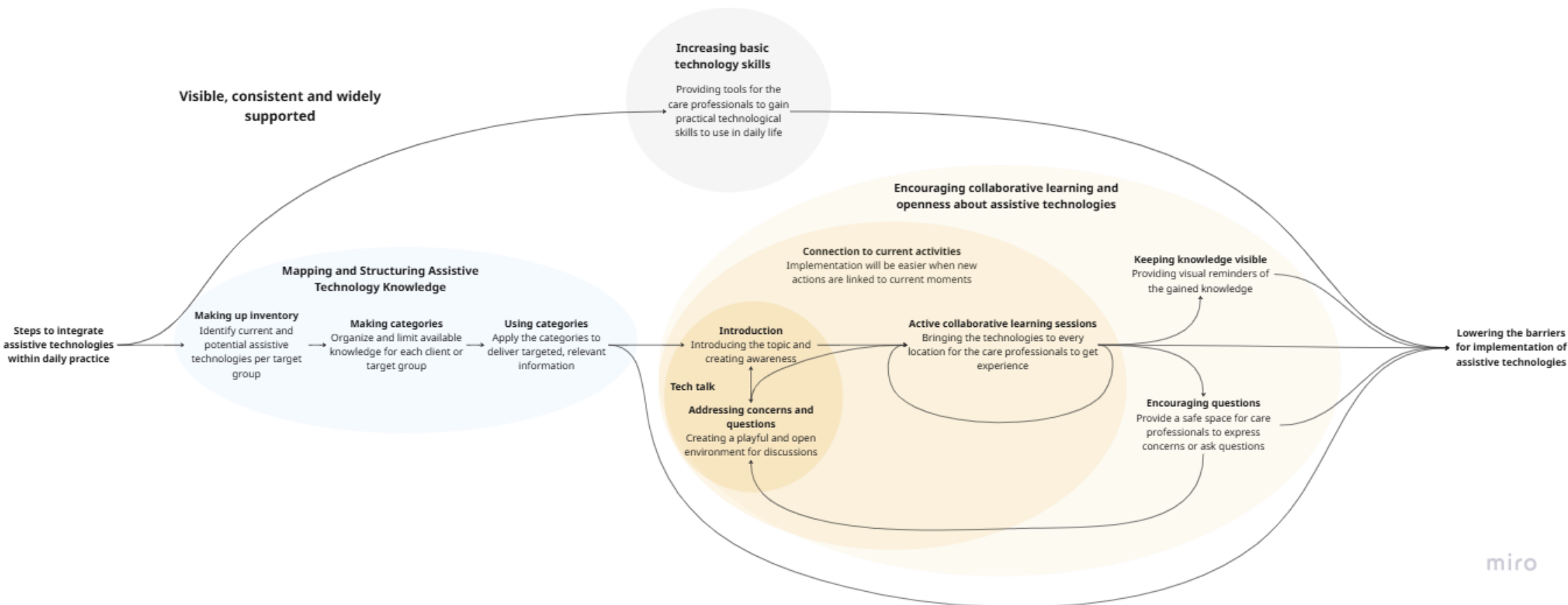
In this chapter, the proposed interventions are presented. Based on the information gathered in this report, an overview has been created outlining the steps Visio could take to enhance the implementation of assistive technologies. The proposed set of interventions is divided into three intervention areas, each addressing a different aspect of the issue. Each intervention area is further subdivided into one or more steps. The intervention areas are discussed in order of their expected influence on the successful implementation of assistive technologies.

Section 8.1 discusses how increasing the basic technology skills of care professionals will improve the use of assistive technologies in daily practice. Section 8.2 explains how mapping and structuring assistive technology knowledge will affect the successful implementation of assistive technologies. Section 8.3 elaborately describes a set of interventions focused on encouraging collaborative learning and openness about assistive technologies. Section 8.4 concludes the chapter by reflecting on the overall approach, highlighting the interconnected nature of the interventions and addressing contextual factors that may influence their effectiveness.

8.1 Introducing the set of interventions

This section introduces the overall structure of the proposed set of interventions. Based on the findings presented in previous chapters, a coherent approach was developed to strengthen the implementation of assistive technologies within Visio. The interventions are organised into three interconnected intervention areas, each targeting a specific but related aspect of the identified challenges.

Rather than functioning as standalone actions, the intervention areas are designed to reinforce one another. Together, they form a structured yet flexible framework that can be adapted to different facilities and team contexts. Figure 33 provides a schematic overview of the proposed intervention areas and their underlying steps.



miro

Figure 33. The overview of the complete set of interventions. The three intervention areas are presented by the three colours: grey, blue and yellow. Every intervention area consists of one or more steps.

8.2 Intervention area 1: Increasing basic technology skills

This intervention area consists of a single step aimed at increasing employees' basic personal technology skills.

It could be argued that this intervention does not fall within Visio's direct responsibility. However, care professionals' limited personal experience with technology strongly influences their motivation to use assistive technologies at work. If Visio were to provide opportunities for employees to develop these personal digital skills and make their use more commonplace, it could therefore have an indirect but substantial impact on the adoption of assistive technologies.

8.3 Intervention area 2: Mapping and structuring assistive technology knowledge

The next intervention area falls within the theme of mapping and structuring knowledge about assistive technologies. This intervention area comprises three consecutive steps designed to create clarity around assistive technology knowledge and reduce information overload.

Step 1: Creating an inventory of assistive technologies

This process begins with creating an inventory of the assistive technologies currently in use. It involves not only identifying which technological tools are being used but also determining for whom they are used. In other words, mapping which products are applied to which client groups.

This will provide an overview of the assistive tools used across different levels of intellectual disability at all Visio locations. It also forms a foundation for assigning unused assistive tools to the appropriate levels of intellectual disability.

Step 2: Categorizing assistive technologies by level of intellectual disability

The subsequent step involves organizing the assistive tools according to the level of intellectual disability. Using the mapping from the previous step, categories can be established that include both the assistive technologies currently in use and those that are not yet implemented for each client group. This categorization also provides a foundation for sorting future assistive technologies as they are introduced.

Step 3: Applying the categories across information outputs

The final step is to apply these categories consistently across all information outputs. They should be integrated into all of Visio's knowledge-sharing

channels, including digital information platforms, email communications, and other digital resources. This approach helps care professionals to locate relevant information more efficiently. Care professionals can immediately determine whether information is relevant to their clients, and Visio can distribute updates only to those for whom they are applicable. This approach helps to reduce the information overload that care professionals are already facing.

8.4 Intervention area 3: Encouraging collaborative learning and openness about assistive technologies.

This intervention area is considered to have the greatest impact. These interventions are designed to encourage employees to learn in a collaborative and open environment. Although they can be implemented independently, their effectiveness will likely increase if the intervention areas of mapping and structuring assistive technology knowledge have already been completed. As this intervention area is considered the most effective, a second graph (Figure 34) has been made that includes a sketch of how each step could be realized. This intervention area consists of several steps that together form a recurring cycle of interventions. Each step is described below.

Step 1: Introduction

The first step is to introduce the concept of assistive technology, preferably during a team meeting. Introducing the topic helps raise awareness, and this also provides an opportunity to personally announce and invite employees to the next phase.

Step 2: Active, collaborative learning sessions

Once care professionals are made aware of the upcoming active, collaborative learning sessions, Visio can provide a predetermined set of assistive technologies tailored to the clients at each location. These sessions are open not only to the care professionals, but also to clients, volunteers, relatives of clients, and other professionals such as paramedical staff and behavioural specialists.

Participants are encouraged to explore the technologies at their own pace and in ways that match their interests. Small, informal learning markets can

be set up where people can try out the technologies, exchange ideas, and share experiences with one another. To support this process, each technology should be accompanied by a person with expertise who can provide guidance and answer questions. Because of the wider group of participants, additional staff will be needed to facilitate and coordinate the sessions. This approach helps participants feel more confident and competent while maintaining a sense of autonomy in how they engage with the technologies, fostering both motivation and a positive learning environment.

To increase participation and ensure the sessions become a natural part of the organization's culture, it is recommended to link them to existing events such as theme days or EMB days (ernstig meervoudig beperkt dagen). Rather than organizing a single event, the sessions should be offered several times a year so that participants can continue to learn, exchange experiences, and build on what they have discovered earlier.

If Visio is unable to implement all proposed steps, this intervention should be prioritized, as it is expected to have the greatest impact on awareness, engagement, and the practical use of assistive technology.

Step 3: Keeping knowledge visible

After the active collaborative learning session, it is important to keep the acquired knowledge visible and accessible in the daily work environment. Providing physical and visual reminders of the assistive technologies helps prevent the information from fading over time. While this could be achieved in multiple ways, the "technology wall" is deemed to be the most effective one. This wall would provide a permanent reminder of the assistive technologies deployable.

The technology wall displays a selection of assistive tools that are relevant for the clients at a particular location. An image of an assistive technology is placed on a tile that contains an NFC tag. When employees, clients, or

visitors hold a smartphone or tablet close to the tag, they can instantly access additional information such as instructions, videos, or examples of use. In this way, the wall combines a tangible and visual overview with easy digital access to deeper knowledge.

Choosing this technological approach was a deliberate decision. Once set up correctly, NFC tags are simple to use and offer a playful, low-threshold way to engage with the information of the assistive technologies. This interaction can help care professionals gain confidence in using technology, while still giving them autonomy to decide whether and how they wish to explore the information.

The effectiveness of the technology wall can be enhanced when combined with the earlier intervention on mapping and structuring assistive technology knowledge. Each wall can be adapted to the specific needs and client profiles of a location. In larger facilities or on locations with multiple client groups, several smaller technology walls may be installed to ensure accessibility and relevance for everyone.

Step 4: Encouraging questions about assistive technologies

Not only is it important to keep the acquired knowledge visible, but it is equally essential to create a safe space where care professionals can express concerns or ask questions about assistive technologies. Many care professionals feel that these technologies are imposed from higher up, rather than being part of their own practice. Offering a place to express these concerns will not only make the care professionals feel heard and understood but also provide valuable insight into the barriers that may still exist. This space should not only be used to express concerns but also to ask questions that arise from previous interventions or from daily work experiences.

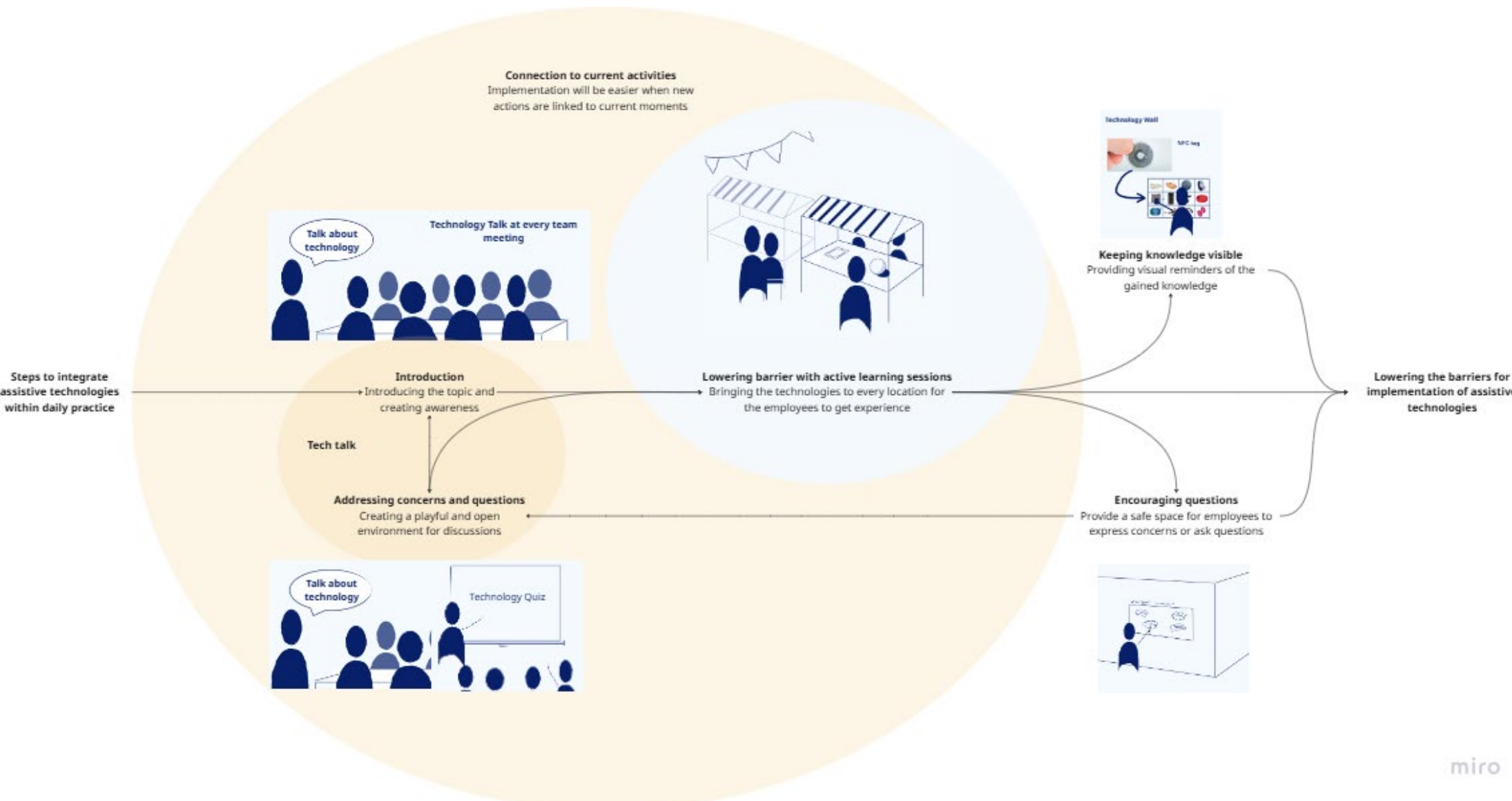


Figure 34. A more detailed overview of the interventions focused on encouraging collaborative learning and openness about assistive technologies. The interventions within the outer yellow circle need to be connected to existing activities. The interventions in the inner yellow circle merge into the recurring Tech Talk. The intervention within the blue circle is considered the most influential.

There are several ways to implement this step. An important aspect is that it should remain low-tech and tangible, since many care professionals still hesitate to use technology. A physical wall or board with handwritten notes could provide a visual reminder that their concerns and questions matter. The handwritten messages show that these thoughts will be acknowledged and not easily forgotten.

Step 5: Addressing concerns and questions

The expressed concerns and questions should be collected and discussed during team meetings or other learning sessions. These discussions should take place openly and constructively, focusing on shared themes gathered from the “concerns and questions” wall rather than on individual remarks.

The format of these discussions can vary. When the notes point to a broader theme or reflect a need for care professionals to express their thoughts and experiences, a technology talk may be the most suitable approach. It allows for more in-depth explanations and reflection on specific topics. When there are numerous smaller or practical questions, a quiz can offer a more interactive and collaborative way to address them.

An open and engaging atmosphere can reduce hesitation towards assistive technologies while also promoting a culture of curiosity and continuous learning.

Step 6: Repeating the cycle

After one full cycle, the steps of Introduction and Addressing concerns and questions gradually merge into a single recurring feature that can be referred to as Tech Talk. Tech Talks bring together elements from the earlier steps, adjusted to what is relevant at that moment. A new assistive technology can be introduced during such a session, while questions or concerns can be explored through open discussion or a short quiz. If there is a period without new technologies or pressing questions, the topic of assistive technology can still remain visible and relevant. Employees

could, for instance, take time to play the previously developed game (Figure 35) or a new activity, such as the quartet game (Figure 36). Engaging in such activities helps to keep the topic present in daily practice, stimulates informal discussions, and encourages continued exploration and use of assistive technologies.



Figure 35. The board game developed by Visio

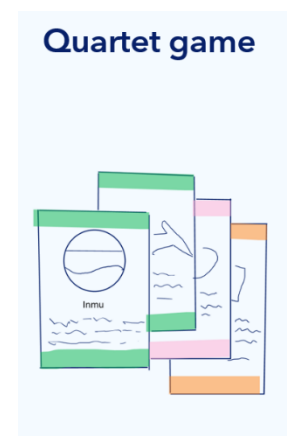


Figure 36. A representation of the quartet game.

8.5 Concluding remarks on the proposed interventions

This chapter presented the designed interventions that form the final result of this graduation project. The interventions were developed to address the identified barriers to the awareness and use of assistive technologies within Visio and together provide a coherent and integrated approach.

The three interventions operate at different but interconnected levels. Increasing basic technology skills targets an important underlying condition for technology adoption. This intervention acknowledges the strong influence of care professionals' personal experiences with technology on their professional behaviour. Mapping and structuring assistive technology knowledge provides a necessary organizational foundation. The interventions aimed at collaborative learning and openness focus on implementing assistive technologies into daily practice and organizational culture.

Instead of relying on a single solution, the strength of this proposed approach lies in the combination of structural, social, and experiential elements. While the collaborative learning interventions are expected to have the greatest impact, their effectiveness is reinforced by the supporting interventions described earlier in this chapter.

While the interventions are intended to be flexible across different locations and client groups, their effectiveness is influenced by contextual conditions, including time constraints, organizational support, and care professional involvement. These factors highlight both the opportunities and the limits of the proposed design.

With the presentation of these interventions, the design phase of this research is concluded.

9. Evaluation and recommendations

This is the final chapter of this project. Section 9.1 provides a brief overview of the project as a whole. Section 9.2 discusses the evaluation with the supervisor at Visio, including the perceived value of the interventions and the identified challenges. Next, recommendations for further implementation and development of the interventions are presented in Section 9.3. An overall reflection on the project and its limitations is presented in Section 9.4. Section 9.5 concludes the project by providing a final overview of the outcomes and closing the graduation project.

9.1. Overview of the research findings

This project aimed to identify the most relevant beneficiary within the implementation of assistive technologies at Koninklijke Visio and to design interventions that support their use in daily care practice for clients with visual and intellectual disabilities. After analysing the clients, the supporters of the care professionals Zorg & Technologie, and the care professionals, the latter were identified as the key stakeholders within this project.

The subsequent phase of the project focused on understanding why knowledge and usage of assistive technologies are limited among the care professionals at Visio. The key underlying factor for this is identified as the absence of a shared learning environment.

The final phase of the project centred on designing interventions to support the awareness and use of assistive technologies within Visio. Based on an analysis of existing barriers and opportunities, a set of interconnected interventions was developed. These interventions were structured around three intervention areas: increasing basic technology skills, mapping and structuring assistive technology knowledge, and encouraging collaborative learning and openness about assistive technologies. The latter intervention area consisted of five intervention steps, each supported by a concept sketch illustrating its potential execution. An overview of the five steps is given in Figure 37.

Among these, the active collaborative learning sessions were considered the most influential. Together, these interventions form the final outcome of this research.



Figure 37. The 5 intervention steps that together form the intervention area encouraging collaborative learning and openness about assistive technologies

9.2 Evaluation of the proposed interventions

The designed interventions were discussed during an evaluation meeting with the supervisor of Zorg & Technologie at Visio. The goal of this evaluation was to understand the value of the interventions for Visio and to identify aspects that may require refinement in the next steps.

Overall, the set of interventions was considered strong, fitting, and promising. The approach was deemed suitable for the context of Visio and was considered to have the potential to improve both knowledge of and openness towards assistive technologies. The combination of multiple interventions was considered to be an asset, as it allows the approach to connect with existing practices while also offering flexibility to adapt to different facilities or teams. At the same time, it was noted that this flexibility requires ongoing attention, particularly with regard to ownership and responsibility for the individual interventions.

During the discussion, Visio indicated that the organization has experienced difficulties in establishing a structured approach to the integration of assistive technologies. Although Visio has previously worked on similar initiatives, a clear and overarching framework was lacking. In this context, the proposed interventions were recognised as providing structure and direction that address this existing gap.

While reflecting on the designed interventions, the supervisor noted that their underlying approach can be characterised as non-formal learning. Although this form of learning is not yet explicitly embedded within Visio, it was recognised as a potentially suitable approach for care professionals in relation to the implementation of assistive technologies. The alignment between the characteristics of non-formal learning and the design of the interventions suggests that this approach may be appropriate for addressing the current situation.

However, achieving sustainable embedding of the interventions was identified as a challenge. While the proposed approach allows for contextual adaptation, this also implies the need for multiple, slightly different implementations. This raises questions regarding responsibility and ownership: specifically, who will take on the role of adapting the approach to individual facilities, and who will be responsible for the continuation of the separate interventions. In other words, the identification of key figures at each facility remains a crucial consideration.

9.3 Recommendation for the subsequent steps

Based on the findings of this research and the evaluation discussion, this section presents several recommendations for potential follow-up steps. These recommendations focus on supporting the implementation and continuation of the designed interventions in a way that fits Visio's organizational context. A visual summary of the proposed recommendations is provided in Figure 38.



Figure 38. An overview of the recommendations supporting continuation and structural embedding

9.3.1 Ownership and sustainable embedding

To support the continuation of the designed interventions, clear ownership within the organization is necessary. As identified during the evaluation, the flexibility of the proposed set of interventions requires ongoing attention and coordination, especially when interventions are adapted to different facilities. Without clear ownership, the risk arises that the interventions remain incidental rather than becoming part of daily practice.

It is therefore recommended to appoint key figures at each facility who take responsibility for the continuation and contextual adaptation of the interventions. These key figures could include behavioural specialists and client supervisors, as these figures are closely involved in daily practice and familiar with the needs of both clients and colleagues. Zorg & Technologie would keep its supporting role by providing expertise and facilitating knowledge exchange across locations.

Clearly defined roles and responsibilities can help ensure that the interventions are maintained over time and adjusted where and when necessary. This will contribute to embedding the interventions structurally rather than remaining standalone activities.

9.3.2 Location-specific implementation

To make the implementation and adoption of the set of interventions as valuable as possible, it may be necessary to adjust the approach to different facilities and teams. As the clients per facility can vary in their disabilities, one facility can have different needs compared to another. The shape of the interventions may therefore differ per facility. For this reason, it is recommended to allow facilities to develop a location-specific approach to shape the interventions according to their client profiles and team dynamics. Adjusting the interventions to the client groups and to the teams will also improve the sustainable embedding of the approach.

9.3.3 Communication and framing

One of the requirements of this graduation project was the use of the English language. For this reason, many of the developed materials were written in English. This has already proven to be a barrier for care professionals. For the continuation of the proposed approach, it is therefore recommended that all materials be developed in the Dutch language.

To make the integration process less daunting for care professionals, it is also recommended to limit the use of the term “technology”. This term is subject to negative preconceptions and can evoke resistance even before the content is introduced. Framing the interventions and the overall approach without explicitly referring to “technology” may support a more open attitude among care professionals. In line with this, it is recommended to place the focus of communication and learning activities on daily care practices and client needs, rather than on the technologies themselves.

9.3.4 Further development of the interventions

Integration of the proposed approach can be further strengthened when care professionals are given the opportunity to influence the shape of the interventions. Printing Figure 34 in a large format and providing space for written input could encourage them to suggest their own interpretations of the interventions. This not only stimulates engagement but also helps ensure alignment with the specific client group and team context.

The quartet game has already been taken into use as a conversation starter between different facilities and was received positively. It was used to share examples of assistive technologies that are already being applied at other locations. During the use of the quartet, several opportunities for improvement were identified. This indicates that the game can be further refined. Continuing the development of the quartet game is therefore recommended, as it supports informal dialogue and shared learning across facilities.

9.4 Overall reflection on the project

This section reflects on the research process and discusses the limitations of the graduation project. The choices made throughout the project are considered, as well as the applicability of the outcomes within the organizational context of Visio. Finally, it briefly looks ahead at the broader relevance of the research.

Throughout the project, several design and research choices were made that influenced the final outcomes. One of these choices was to focus on care professionals as the primary target group. Initially, the researcher preferred to focus on the clients, as the limited availability of assistive technologies specifically designed for clients with visual and intellectual disabilities was perceived as a challenge from a design perspective. The absence of such tailored solutions felt problematic and motivated an initial desire to address this gap directly. However, the researcher stands behind the decision to focus on care professionals, as this focus is considered most valuable within the current organizational context and is expected to have a positive indirect effect on the clients.

In addition, the project turned into a co-creative and practice-oriented approach, closely involving care professionals throughout the design process. Instead of testing predefined solutions, the focus was on understanding the needs of the care professionals and translating these into possible interventions. Although this meant that the effectiveness of the interventions is not yet tested, this approach allowed the design to remain closely aligned with the context and needs of the organization. However, as the designed interventions are strongly informed by the preferences of the care professionals, and the quartet game has already demonstrated its value in practice, it is expected that the remaining interventions may show similar relevance and potential effectiveness.

This project has several limitations that should be taken into account when interpreting the outcomes. The research was conducted in close

collaboration with Visio, which means that the outcomes are strongly tied to the organizational context and daily practice of this organization. As a result, the outcomes cannot be transferred one-on-one to other organizations and may require contextual adaptation. In addition, the designed interventions have not been implemented yet and have, therefore, not been evaluated over a longer period of time. The long-term effectiveness of the interventions have, therefore, not been proven yet. The outcomes of this project should, therefore, be understood as a context-specific design proposal that can serve as a starting point for further development and exploration.

Despite these limitations, this graduation project highlights the value of non-formal learning as a means to support awareness and use of assistive technologies within Visio. By approaching assistive technology integration as a shared and practice-oriented learning process, the project emphasizes learning and adaptation instead of delivering a ready-made technological solution. The designed interventions should be understood as a starting point for further development rather than as a final answer. The strength of the set of interventions lies in their ability to stimulate dialogue, reflection, and gradual change within daily practice.

9.5 Concluding the project

This chapter started by providing a concluding overview of the graduation project. The evaluation with Visio provided insight into how the designed interventions were received and highlighted both their perceived value and the challenges related to implementation and sustainability. The presented recommendations are intended to support Visio in further development and implementation of the interventions. In addition, the chapter addressed the limitations of the project and reflected on the value of the outcomes within the organizational context of Visio. Rather than offering a definitive solution, this project concludes with a set of interventions that can serve as a foundation for further learning, adaptation, and development within daily practice.

10. References

Koninklijke Visio. (2015, July). *Brochure Visio De Blauwe Kamer* [Brochure].

<https://www.visio.org/visio.org/media/Visio/Downloads/Folders-en-brochures/Brochure-Visio-De-Blauwe-Kamer-PDF-07-2015.pdf>

Koninklijke Visio. (2024). *TG-krant landelijke zorg & technologie 2024*. https://www.visio.org/media/3nbomrqc/tg_krant-landelijke-zorg-technologie_2024.pdf

Koninklijke Visio. (2025, May 7). *From insight to application: Implementing technology with care professionals*. Retrieved May 14, 2025, from <https://www.visio.org/home/actueel/nieuws/2025/mei/van-inzicht-naar-toepassing-technologie-inzetten-met-zorgprofessionals/>

Koninklijke Visio. (n.d.-a). *Aanmelden en financiën*. Retrieved April 9, 2025, from <https://www.visio.org/nl-nl/wonen-dagbesteding/aanmelden-en-financien>

Koninklijke Visio. (n.d.-b). *Expertise*. Retrieved May 9, 2025, from <https://www.visio.org/expertise/>

Koninklijke Visio. (n.d.-c). **Geschiedenis**. Retrieved April 7, 2025, from <https://www.visio.org/home/over-visio/geschiedenis/>

Koninklijke Visio. (n.d.-d). **Missie, visie en strategie**. Retrieved April 7, 2025, from <https://www.visio.org/nl-nl/home/over-visio/missie/>

Koninklijke Visio. (n.d.-e). **Onderwijs**. Retrieved April 7, 2025, from <https://visio.org/onderwijs/>

Koninklijke Visio. (n.d.-f). **Over Visio**. Retrieved April 7, 2025, from <https://www.visio.org/home/over-visio/>

Koninklijke Visio. (n.d.-g). **Onderzoeken, projecten en expertise**. Retrieved April 7, 2025, from <https://www.visio.org/professional/expertise/onderzoeken/>

Koninklijke Visio. (n.d.-h). **Revalidatie & Advies**. Retrieved April 7, 2025, from <https://www.visio.org/revalidatie-en-advies/>

Koninklijke Visio. (n.d.-i). **Veilig, vertrouwd en aangepast**. Retrieved April 9, 2025, from <https://www.visio.org/nl-nl/wonen-dagbesteding/adressen-wonen-dagbesteding/breda-de-blauwe-kamer/veilig-vertrouwd-en-aangepast/>

Koninklijke Visio. (n.d.-j). **Werk & Re-integratie**. Retrieved April 7, 2025, from <https://visio.org/werk-re-integratie-visio-zicht-op-werk/>

Op het Veld, P. (2024, July 8). *Model A1: Activiteitenplan Implementatiestart. Stimuleringsregeling Technologie in Ondersteuning en Zorg (STOZ)* [Unpublished internal document, Koninklijke Visio].

Piekema, L. (2022). *Technology and people with visual and intellectual disabilities: What professionals need*. Academische Werkplaats EMB. Retrieved from https://aw-emb.nl/media/Factsheet_Professionals-onderzoek-inzet-technologie-Lotte-Piekema-Academische-Werkplaats-EMB-1.pdf

Piekema, L., ten Brug, A., Waninge, A., & van der Putten, A. (2024). Attitudes of support people: A key element when implementing technologies for people with intellectual and visual disabilities. *Disability and Rehabilitation: Assistive Technology*. Advance online publication. <https://doi.org/10.1080/17483107.2024.2387774>

Rijpkema, W. I. (2022). *Technologieën in de zorg: De invloed van de attitude van zorgprofessionals en naasten – Een onderzoek naar de attitudes van de zorgprofessional en naasten waarbij het duurzaam gebruiken van technologie centraal staat om zo de kwaliteit van leven bij personen met een beperking te optimaliseren* [Unpublished master's thesis]. University of Groningen, Faculty of Behavioural and Social Sciences.

Spoelman, F. (2022). *Een kwantitatief onderzoek naar de implementatie van technologische hulpmiddelen op organisatieniveau* [Unpublished master's thesis]. University of Groningen, Faculty of Behavioural and Social Sciences.

Ter Harmsel, J. (2021, November 1). *SoVisio, our new intranet, launched today at Koninklijke Visio!* [Post]. LinkedIn.
<https://www.linkedin.com/posts/janterharmsel-trots-sovisio-ons-nieuwe-intranet-is-vandaag-activity-6848308881437941760-kqNt>

Wieringa, E. (2024, June 9). *De ontwikkeling van een leerervaring volgens het escaperoom-concept voor cliëntbegeleiders in de gehandicaptenzorg, om de adoptie en implementatie van technologie in het zorgproces een goede impuls te geven* [Unpublished master's thesis]. NHL Stenden University of Applied Sciences.

Appendix

Appendix A: Project Brief

A zoo-like experience for people with a visual and intellectual disability

project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

start date 06 - 12 - 2022

22 - 06 - 2023

end date

INTRODUCTION **

Please describe, the context of your project, and address the main stakeholders (interests) within this context in a concise yet complete manner. Who are involved, what do they value and how do they currently operate within the given context? What are the main opportunities and limitations you are currently aware of (cultural- and social norms, resources (time, money,...), technology, ...).

In the Netherlands, there are over 440 000 people with an intellectual disability (Verstandelijke Beperking, n.d.) of which/ whom more than 25 percent also have a visual impairment (Visuele & Verstandelijke Beperking, n.d.). These two types of disabilities amplify each other when it comes to understanding the world around. Comprehending the surroundings becomes difficult when you cannot rely on your sight and do not have the mental capability to compensate with language or memory (Visuele En Verstandelijke Beperking, n.d.).

When it comes to designing a tool to create new experiences for people with a disability, the focus lies on people with only one disability. For example, the Innovation Room of 's Heeren Loo aims to create experiences for people with an intellectual disability of activities they would normally not be able to do, like riding a bike, swimming with dolphins (Figure 1), going to the theatre or going horseback riding (Figure 2). The Innovation Room helps people with an intellectual disability to learn, relax, exercise and to experience (De Innovatieruimte, 2022). While the Innovation Room shows that people with an intellectual disability do not need an exact copy of reality to enjoy the experience, their solutions highly rely on visual stimulation. This is also the case when looking at alternative reality experiences suited for people with an intellectual disability (Immersieve Technologie, n.d.). There are apps and virtual reality rigs that are adapted to the mental understanding of people with an intellectual disability. Unfortunately, these are also mostly in the sighted spectrum.

However, when it comes to experiences for people with multiple disabilities, very little is known. People with a visual and intellectual disability have a hard time articulating their needs and are not able to leave their facility without sufficiently qualified supervisors. This can lead to frustration and boredom, which does not only affect the patient, but also their caretakers and family (Aggarwal et al., 2020). This is what Visio wants to address. Visio has multiple day care facilities for people with a visual and intellectual disability through the Netherlands and they want to create more experiences for people with these two types of disabilities. Their caretakers have noticed a great affection for animals among these people and are wondering what the possibilities would be of letting them experience zoo animals.

Sources:

- Aggarwal, R., MD, Guanci, N., MD, & Appareddy, V. L., MD. (2020, November 16). Issues in Treating Patients With Intellectual Disabilities. *Psychiatric Times*. Retrieved November 25, 2022, from <https://www.psychiatrictimes.com/view/issues-treating-patients-intellectual-disabilities>
- De Innovatieruimte. (2022, February 11). 's Heeren Loo. Retrieved November 25, 2022, from <https://www.sheerenloo.nl/in-de-buurt/onze-woonzorgparken-wijken/groot-schuylenburg/de-innovatieruimte-in-ape-ldoom>
- Immersieve technologie. (n.d.). Immersive Care. Retrieved November 25, 2022, from <https://immersivecare.be/it/>
- Verstandelijke beperking. (n.d.). Volksgezondheid En Zorg. Retrieved November 25, 2022, from <https://www.vzinfo.nl/verstandelijke-beperking>
- Visuele en verstandelijke beperking. (n.d.). Bartimeus. Retrieved November 25, 2022, from <https://bartimeus.nl/expertise/het-ontwikkelen-van-onze-expertise/visuele-en-verstandelijke-beperking>
- Visuele & verstandelijke beperking. (n.d.). Koninklijke Visio. Retrieved November 25, 2022, from <https://www.visio.org/professional/expertise/onderzoeken/visuele-verstandelijke-beperking/>



image / figure 1: VR swimming at the facility of 's Heerenloo



image / figure 2: Horseback riding with the movementchair

PROBLEM DEFINITION **

Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

During this project, the goal is to research the possibilities of creating a zoo-like experience for people with a visual and intellectual disability at the day care facility. According to the caretakers, there is a great interest among people with a visual and intellectual disability in animals. At the start of this project, the focus will be on experiencing the zoo as this could lead to more insights. Later on, the decision can be made to make the focus more narrow. If these people would go to the zoo, what would they experience of the animals given their visual impairment? As these people cannot easily leave their facility, a trip to the zoo is not an option. Therefore, the experience should be located at the day care facility.

As this target group is unfamiliar and with little literature to continue on, a lot of research will need to be done to get a better understanding of how people with a visual and intellectual disability experience the world. Once a better understanding is developed, research can be done on how the target group wants to experience zoo animals. Is there a need for high-tech solutions or for non-tech tactile objects. It could also be that testing shows that a combination of both would come to the best results. As this group cannot articulate themselves very well, the best approach is to give the target group a concept to test and evaluate the results by observing and talking to the caretakers.

When talking to Visio, it became also clear that some clients do not ask how to do things, because they feel like a burden to the caretakers. Therefore, it is important that the users can do this experience intuitively and with a feeling of independence.

ASSIGNMENT **

State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

The goal is to create a zoo-like experience for people with a visual and intellectual disability. The result will be a concept that is adjusted to the understanding of the target group and will stimulate the senses the target group can use. The concept location of use will be at the day care facility and should give the users a feeling of being in control.

As a big part of this project will be understanding the user, their world and their abilities, the end result will be a concept that is tested and that can be used by Visio to approach a company that can manufacture such objects. The concept will allow the user to experience zoo animals in a safe environment and that is in line with the intellectual and physical abilities of the target group. The aim is to let the target group use the concept as independently as possible. This will give the user a feeling of being in control instead of being dependent on the caretakers. The concept is aimed to let the target group experience animals like they normally cannot and could, therefore, possibly have a positive effect on the emotional well-being of the users.

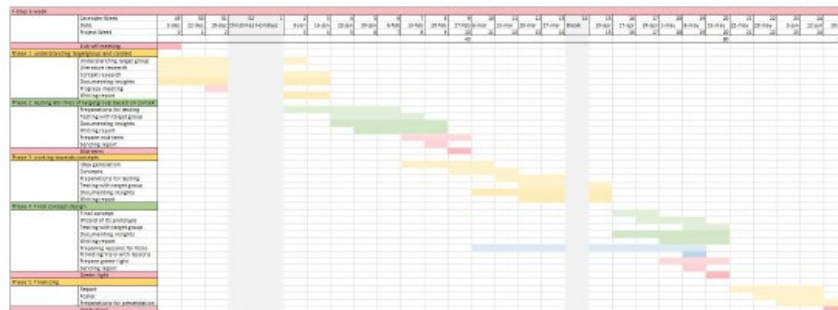
As the caretakers are the ones that are going to support the target group in using the experience, any technology used should also be easy to handle for the caretakers and when high-tech is used, the need might arise for the use of Artificial Intelligence and for autonomous running of the experience. The technology should also be made robust enough to handle any rough use cases.

Not only is this project about making an experience for people with a visual and intellectual disability, it is also about learning and taking lessons from designing with and for this target group. These lessons should also be adequately communicated to Visio. It could be that the lessons learned from this project are also applicable in other situations or even show that the experience would not only be beneficial to the people with a visual and intellectual disability, but also to the people in retirement homes or to the visitors of the zoo as an extended experience of the zoo.

PLANNING AND APPROACH **

Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.

start date 6 - 12 - 2022 end date 22 - 6 - 2023



My kick-off meeting will be on 6 December and I will officially start on 8 December on the project. I will start visiting the day care on 12 December. I will work 4 days a week on my graduation project. I have chosen to do this because I know my work will benefit from having time to spend on other activities. I will take the Wednesdays off. This extra day will also allow me to work besides graduation. I will take the Christmas Holidays off and I am planning to take a break somewhere between the Mid-term and the Green-light meeting. I have now planned this break at the beginning of April, but this week is not yet fixed.

I have no experience with the target group and therefore planned the first weeks to spend on getting to know the target group and allowing myself to understand the world they live in. Not only do I need to get to know the target group, but they also need to get to know me to establish a bond that will make testing later on easier. In the next phase, I want to do some quick tests with the target group to find out what senses they prefer to be stimulated and what level of technology fits with their level of understanding.

Based on the insights of the first phases, I will start generating ideas and convert these into concepts. These concepts will be tested by the target group again. Based on the insights of the concepts, one final concept will be designed and made into a prototype that can be tested. During this phase, lessons will come forward that I will later share with Visio.

In the final phase, the focus will be on finalizing the documentation of the project and working toward the presentation. I have made documenting part of every phase to prevent having to do all this work at the end of the project.

MOTIVATION AND PERSONAL AMBITIONS

Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed. Optionally, describe which personal learning ambitions you explicitly want to address in this project, on top of the learning objectives of the Graduation Project, such as: in depth knowledge a on specific subject, broadening your competences or experimenting with a specific tool and/or methodology, Stick to no more than five ambitions.

During my master, I started noticing the importance of Inclusive Design. It surprised me how many people are secluded from daily activities because the interactions are not fit for their abilities. Most of the time people simply forget that there are people with disabilities because they are not acquainted with them. Even though I thought my awareness of this issue was raised enough, even I missed a group to take into account: people with multiple disabilities. The target group of this project is one I have not worked with before, so working with them will be a challenge. I want to learn how to communicate and work with these people, as I was never taught to deal with my intellectually disabled niece and sincerely regret this.

I have done multiple courses on Inclusive Design and other courses for which immersion into a new target group was necessary and critically look at what emerges as pain points. These pain points form the base of creating new opportunities and possibilities. I want to use this knowledge to immerse myself in a target group that is not that common to further develop this skill.

I choose to work with an organization as a client, as I think the study program in the masters does not provide this enough. Doing the graduation project at a location with working people will better prepare me for the future. I will have to work with multiple stakeholders and have to communicate my work to them properly, but I will also have to take their opinions, knowledge and perspectives into account while working on the matter.

Appendix B: Observations during the first two weeks of the project

In the first two weeks of this project, observations were done at different locations within the Blauwe Kamer.

General Observations Across Different Groups

- There are significant differences in intellectual and physical capabilities among the clients.
- Even within the same level of intellectual disability, abilities vary greatly. One client may be focused on a shoelace, while another is capable of ripping an electrical cord from the ceiling.
- Clients thrive on rhythm, consistency, and routine. Unexpected changes cause distress.
- Most clients have a very short concentration span—activities should last about 10 minutes, with a maximum of 45 minutes.
- Objects should be easy to grab, as many clients have malformed hands or motor difficulties.
- 90% of the clients are unable to speak or understand spoken language.
- Although their awareness of their surroundings seems limited, some clients are very aware of social norms and capable of having conversations.
- Clients express a desire for more technology.
- The location is well adapted for clients with visual disabilities.
- Animals are present on-site (cats, dogs, petting zoo), but it is unclear how aware the clients are of them.

Observations at the Petting Zoo (ZB)

- Clients and their caretakers run the petting zoo.
- Summer and winter activities differ significantly.

- Clients are there because they enjoy it or because their families have decided for them.
- Due to this, there is a wide range of disabilities among the clients. Some are very vocal and independent, while others spend the entire day in a wheelchair doing nothing.
- Some clients are very clever (even manipulative) in their interactions with others, creating difficult situations.
- Their hearing is highly developed—they can hear the whispering of other clients and even the hooves of horses.
- Since it is not always certain whether the horses will go out, caregivers avoid discussing them to prevent disappointment.
- There is a lot of interaction between clients, with some forming strong social groups.
- Many clients have spastic movements, possibly related to Tourette's Syndrome.
- They function best with a fixed schedule: meals and coffee breaks happen at the same time every day, in the same order.
- Many clients have difficulties with fine motor skills and cannot grasp objects like others do.
- They follow strict learned rules and struggle with deviations (e.g., chickens can only eat apple and pear leftovers, plates must be stacked in a certain way).
- Most activities can be done alone, except for those related to personal health (e.g., food preparation, using the toilet).
- Clients do not inform caretakers when they have finished an activity.
- One client requires a high level of structure. Initially, caregivers used visual cues to guide her, but this caused too much stress. Now, they verbally explain her daily schedule each morning.
- Example activity: Collecting seashells from a box and dropping them through a small hole in a tin can. The action creates sound,

which motivates the client. After finishing, they dump the shells back into the box and start again.

Observations at the Daycare Center (DCS) - Group for Clients with Behavioral Issues

- This group consists of 5 to 7 clients with 1 or 2 caregivers.
- All clients have similar levels of intellectual disabilities but are placed in this group due to behavioral challenges.
- The morning started stressfully due to disruptions in their routine, making clients restless.
- The mere presence of an observer sitting quietly affected their behavior.
- This group is focused primarily on sensory experiences rather than structured activities.
- Clients make a lot of noise but cannot speak. One client constantly makes sounds. Initially, this was intimidating, but caregivers explained that it was a sign of happiness and engagement.
- The daily schedule remains fixed, with activities happening at the same time each day.
- One client would function better in a quieter group, as she struggles with the high noise level.
- Physical stimulation is needed to aid bowel movements—small walking tasks or 5 minutes on a treadmill help.
- A client with the intellectual ability of a baby enjoys having a towel rubbed on his face by the caregiver.
- Caregivers initiate all activities.
- Saying encouraging words and addressing clients by name is motivating.
- Example activity: Picking up small objects from a box and putting them through a hole in a tin can.
- One client can perform more tasks due to better fine motor skills.
- A caregiver played the guitar, triggering different reactions from clients. Some enjoyed the sensation by placing their hand on hers to feel the movement, while others sang along. However, they reacted differently than usual because she sang Christmas songs instead of their usual songs. Any deviation from routine can upset them.
- Caregivers understand the unique sounds, movements, and word associations of each client, whereas an outsider may not. Each client has their own “manual” of communication.
- Their intellectual disabilities are the most dominant factor. It is unclear whether visual perception would help them or lead to overstimulation, making them harder to handle.
- Clients can understand action and reaction to some degree, with caregiver assistance.
- Having consistent caregivers for each group is ideal, as they understand recent events that influence behavior. However, if a caregiver falls ill, a sudden replacement causes immense stress and makes clients difficult to manage.
- Some clients are blind not because of eye malfunction but because their brain cannot process visual input.
- A client noticed "snow" on the window and rubbed it away. It was unclear whether she did this because she believed it shouldn't be there or simply enjoyed the action-reaction effect. The caregiver suggested she did it for enjoyment, as she left the Sinterklaas decorations untouched.
- **Paro Robot:** Caregivers mentioned that the Paro robot is no longer used because clients handled it too roughly, and it began responding negatively.
- Clients tend to put objects in their mouths and attempt to eat them, which requires constant supervision.
- Clients can repeat the same activity endlessly, such as grabbing a handful of beans and slowly releasing them.

- Negative experiences can lead to long-term insecurity and loss of abilities. One client, after being pushed over, no longer walks alone and always seeks support from objects.

Observations at the Daycare & Meeting Space (OC)

- This location serves as both a daycare and a space where employees can hold meetings or perform administrative tasks.
- 10 clients are present, along with one employee and one volunteer.
- There are major differences in vocal abilities—some clients can hold conversations, while others only make noises. However, all clients understand what is being said and react accordingly.
- Clients are assigned small tasks that may seem insignificant to outsiders but are challenging for them (e.g., fetching groceries, delivering items to other departments, washing dishes, making soup).
- They have work tasks, such as screwing two elements together, which are complicated but highly engaging for them.
- Most clients live in their own world, with minimal interaction between them. Tasks are performed individually.
- Employees from other departments visit for coffee, meetings, or administrative work, but there is little interaction with clients. Some are in a hurry, while others (e.g., maintenance staff) show indifference.
- Even when visitors do not acknowledge them, clients are aware of their presence but do not know how to react. When visitors do engage, clients respond warmly.
- A client assigned to shred paper shows deep concentration while picking up paper but lights up with excitement when the shredder makes noise, indicating that sound feedback is highly motivating.
- A volunteer explained that before COVID-19, employees bought lunch from the clients, leading to valuable social interaction. This tradition has not returned, even though COVID is no longer a major issue.

- Traditional interview techniques do not work with this group. Clients struggle to articulate why they enjoy certain activities. When encouraged to continue speaking, they simply repeat “yes,” and silence signals the conversation's end.
- Employees are dissatisfied with the state of the facilities and fear that valuable activities (e.g., therapy pool, horseback riding) will be discontinued.

Appendix C: Considered concept directions

Multiple concept directions were considered before focusing on the two remaining concept directions.

Improving an existing product (like Paro or the treadmill)

Both the Paro and the treadmill currently used by clients at the Blauwe Kamer were originally designed for a different target group. Observations revealed that these products do not fully align with the needs and physical abilities of the clients. This issue arises because neither product was specifically designed for this group, leading to a suboptimal user experience.



Designing a tool or game with and for the clients

Many assistive tools are designed for a different target group, making them less suitable for clients and failing to meet their specific needs.

However, there are still many opportunities to develop tools that truly align with their abilities and challenges, enhancing independence and engagement.

Limited research exists on designing for people with both a visual and intellectual disability. Expanding this research could lead to new products and design principles, fostering more effective and inclusive solutions.



Developing a product for snooze moments for clients (Sleeping Sloth)

Many products are recommended to improve the sleep quality of clients, often sharing similar features: weighted elements, warmth, gentle touch, breathing and heartbeat simulation, white noise, music, storytelling, and restlessness detection.

However, these products are primarily designed for children, making them less suited to the specific needs of clients. There is an opportunity to develop solutions that better align with their requirements, ensuring a more effective and comfortable sleep experience.



Interactive ball

This self-moving ball is designed to engage clients by independently approaching them while producing sound. By doing so, it reduces the need for staff intervention in initiating interaction, allowing clients to engage more spontaneously.

The ball features bright, high-contrast colors to ensure visibility for those with limited vision, making it easier to track and interact with. Its concept is similar to **Fizzy the Robotic Ball** ([link naar fizzy?](#)), offering an engaging and stimulating experience tailored to the needs of the clients.



User experience of the Kennisportaal

The Kennisportaal offers a wide range of information and knowledge for and about individuals with a visual impairment. However, the website offers only basic accessibility features such as adjustable font size and a dark mode option. It lacks essential functions like a screen reader and a persistent navigation bar, the menu disappears while scrolling, making navigation difficult. Additionally, the search function only matches exact words without considering the relevance of the results, which often leads to unhelpful outcomes. Images of the theme's shown in dark mode also lack sufficient contrast, further reducing accessibility for users with visual impairments.

This project direction would aim to improve the digital accessibility and clarity of the online information provided by Koninklijke Visio. The aim is to make it easier, faster and more intuitive for people with visual (and intellectual) disabilities, as well as their caregivers, to find and apply the right information.



Several potential concept directions were considered but ultimately not pursued for various reasons:

Improving an existing product

Enhancing products like Paro or the treadmill was explored but was not selected as there was a lack of passion for these options.

Designing a tool or game with and for the clients

This was the initial approach of the project, aiming to create a tool or game tailored to the clients' needs. However, this required extensive observations and interviews to gain deeper insights into their abilities and preferences. Due to the high energy demands of this process, this direction was discontinued.

Developing a product for snooze moments

This concept focused on creating a product to support clients during snooze or sleep moments. However, since these moments primarily occur in the evening, it was deemed unsuitable for further development.

Interactive ball

This direction was inspired by an existing project from Delft University of Technology. However, it required a significant amount of programming expertise, which was outside my skill set. Learning such a complex new skill would have demanded too much time and energy, so this option was not pursued.

User experience of the Kennisportaal

The user experience of the Kennisportaal could be significantly improved with a few minor adjustments to the website, which Visio could implement quickly. However, the most meaningful improvements to usability would require a complete redesign of the website's structure. Since such a fundamental change would be complex, it was considered impractical and unlikely to be feasible for Visio at this time.

Appendix D: Interview set-up understanding care professionals

Purpose of the interview

The interview was designed to gain insights into why the use of assistive technologies among care professionals at Visio remains limited. The goal was to identify both barriers and enabling factors that influence how staff members learn about technological tools, how they apply them in practice, and how team and organizational culture shapes their attitudes and behaviours.

Interview approach

A semi-structured interview method was used. A predefined list of guiding questions (which can be found later in this chapter) provided structure while allowing enough flexibility to explore emerging topics in depth. When participants made interesting or unexpected remarks, spontaneous follow-up questions were asked to delve deeper into their experiences and viewpoints. This approach ensured rich and nuanced insights.

Preparation and participant information

Prior to the interview, participants received an invitation (which can be found later in this chapter) with information about the research objectives, the context of the study, and practical details for scheduling the session. An informed consent form was included (which can be found later in this chapter), in which participants provided explicit permission for the recording of the conversation.

All participants were employees of Visio, working at different locations and with varying levels of experience and affinity with technology. To protect privacy, pseudonyms were assigned and identifying details were removed or anonymized.

Interview setting and procedure

The interview was conducted online via Microsoft Teams, based on the participant's preference. The recording was made using the platform's built-in functionality.

- **Duration:** approximately 45–60 minutes
- **Format:** one-on-one conversation
- **Participants:** the researcher and one interviewee
- **Recording:** audio and video via Microsoft Teams

The interview began with a short introduction, followed by six thematic sections:

1. Learning about assistive tools
2. Learning from direct colleagues
3. Use of supportive sources
4. Use in practice
5. Team and organizational culture regarding technology
6. Needs and ideas

The interview concluded with several wrapping-up and reflective questions.

Transcript creation and initial processing

The interview recording was automatically transcribed by Microsoft Teams. While this provided a helpful starting point, the raw transcripts contained several inaccuracies such as missing words, misinterpreted phrasing, and unclear segments. To refine and structure the material, ChatGPT was used as an analytical aid.

Use of ChatGPT for structuring and summarizing

ChatGPT supported the analysis process in the following ways:

- The transcript was processed per thematic section.
- ChatGPT was asked to extract key points and structure them into **bullet points**.

- For each section, ChatGPT generated one representative quotation.
- After processing each interview, ChatGPT was asked to summarize the insights per question theme across the interviews.

This helped organize the material and provided a clear overview of the themes discussed.

Limitations of ChatGPT and researcher validation

Although ChatGPT was useful for structuring and condensing information, it has limitations:

- It does not distinguish between central points and side remarks.
- Occasionally, the summaries emphasized less relevant comments.
- Important but subtle remarks were sometimes omitted.

Therefore, each overview generated by ChatGPT was carefully reviewed and corrected by the researcher.

The researcher:

- verified whether the main meaning had been captured accurately;
- removed irrelevant or misleading points;
- reinstated important insights that were missing;
- checked and corrected quotations for accuracy and completeness.

ChatGPT served as a supportive tool for organizing information, but the interpretation and final analysis were carried out solely by the researcher.

Consent form

TOESTEMMINGSFORMULIER VOOR OPNAME INTERVIEW (ONLINE MEETING)

Onderwerp van het interview: Gebruik van technologische hulpmiddelen in het werk met mensen met een visuele en/of verstandelijke beperking

Datum:

Interviewer/onderzoeker: Isolde Broersma

Platform:

Doel van de opname:

Deze online meeting wordt opgenomen in het kader van een interview waarin wordt besproken hoe jij omgaat met technologische hulpmiddelen in je werk: hoe je erover leert, hoe je ze gebruikt en welke uitdagingen je daarbij tegenkomt. De inzichten uit dit gesprek worden gebruikt om beter te begrijpen wat er nodig is om technologie op een goede manier in te zetten in de ondersteuning van mensen met een visuele en verstandelijke beperking.

Gebruik en opslag van de opname:

- De opname wordt uitsluitend gebruikt voor analyse- en verslagleggingsdoeleinden binnen dit project.
- De opname wordt veilig opgeslagen en is alleen toegankelijk voor de onderzoeker(s).
- De opname wordt niet gedeeld met derden of openbaar gemaakt zonder jouw uitdrukkelijke toestemming.
- De opname wordt uiterlijk na een jaar verwijderd.

Jouw rechten:

- Deelname is vrijwillig. Je kunt ervoor kiezen om niet opgenomen te worden.
- Je mag op elk moment je toestemming intrekken, zonder opgave van reden.
- Je hebt het recht om inzage te vragen in de gegevens die over jou worden vastgelegd, en om correctie of verwijdering daarvan te vragen.

Toestemming:

- Ik geef toestemming voor het opnemen van dit interview en het gebruik van de opname voor de hierboven genoemde doeleinden.
- Ik geef *geen* toestemming voor het opnemen van dit interview.

Naam deelnemer: _____

E-mailadres: _____

Handtekening (of naam bij digitale toestemming):

Datum: _____

Invitation to the interview

Over mij en mijn onderzoek <p>Mijn naam is Isolde en ik studeer <i>Design for Interaction</i> aan de TU Delft. Voor mijn afstudeerproject werk ik samen met Koninklijke Visio. In mijn onderzoek wil ik beter begrijpen hoe medewerkers in de zorg leren over en omgaan met technologische hulpmiddelen, zoals jij in je werk misschien ook tegenkomt.</p> <p>Deze uitnodiging is bedoeld voor jou, omdat jij werkt met mensen met een visuele en verstandelijke beperking. Jouw ervaringen zijn voor mij ontzettend waardevol. Er zijn geen goede of foute antwoorden, ik ben juist benieuwd naar jouw werk in de zorg, jouw mening en wat jij nodig hebt.</p>	
Wat bedoel ik met technologische hulpmiddelen? <p>Dit zijn hulpmiddelen die technologie gebruiken om cliënten of begeleiders te ondersteunen in de zorg. Soms zijn ze duidelijk technisch, zoals een spraakknop of digitale dagplanner. Maar ook hulpmiddelen met een speelse of sociale insteek vallen hieronder. Denk bijvoorbeeld aan:</p> <ul style="list-style-type: none">- Paro, Moofie, de CRDL, de Belevenistafel, CosmoSwitch, Jooki- Tablets met speciale apps of aangepaste bediening- Hulpmiddelen die helpen met communicatie, structuur, beleving of contact	Wat vraag ik van jou? <p>Het interview bestaat uit twee gesprekken van ongeveer 30–45 minuten. We doen dit in twee delen, zodat er tussendoor tijd is om dingen te laten bezinken en eventueel iets aan te vullen.</p>
Denk alvast eens na over: <ul style="list-style-type: none">- Hoe ziet een standaard dag er voor jou uit?- De laatste keer dat je iets leerde over een nieuw hulpmiddel, wat gebeurde er toen?- Hoe zoek jij meestal informatie of hulp als je iets niet weet over technologische hulpmiddelen?- Wat zou jou kunnen helpen om technologie makkelijker in je werk te gebruiken?	Praktische informatie <p>Locatie: het interview vindt online plaats (bijvoorbeeld via Microsoft Teams, Zoom of een ander platform dat jij prettig vindt). Duur: ±30–40 minuten per gesprek. Wanneer: ik neem contact met je op om samen een moment te plannen. Je krijgt een toestemmingsformulier. Hiermee geef je toestemming dat het gesprek wordt opgenomen en alleen wordt gebruikt voor mijn afstudeeronderzoek. Alles wat je deelt, wordt vertrouwelijk behandeld.</p>
Mee doen? <p>Als je mee wilt doen, laat het me gerust weten. Dan plannen we samen het eerste gesprek in.</p> <p>Dankjewel alvast voor je tijd en betrokkenheid!</p>	

Interview 1

Introduction:

Bedankt dat je mee wilt doen aan dit interview. Ik ben Isolde en ik studeer Design for Interaction aan de TU Delft. Drie jaar geleden begon ik met afstuderen bij Visio, maar toen kreeg ik corona en sindsdien heb ik last van overprikkeling en vermoeidheid. Dat heeft ervoor gezorgd dat ik mijn project moest aanpassen, zodat het beter past bij wat ik nu aankan. Eén van die aanpassingen is dat het interview in twee delen wordt gehouden, met wat tijd ertussen.

Je hebt van tevoren een toestemmingsformulier ontvangen. Als je dat hebt ingevuld, dan neem ik vanaf nu dit gesprek op.

In dit interview wil ik graag van je horen hoe jij omgaat met technologische hulpmiddelen in je werk: hoe je erover leert, hoe je ze gebruikt, en wat je daarbij tegenkomt. Ik praat met mensen zoals jij omdat jullie ervaring hebben in het werken met mensen met een visuele en/of verstandelijke beperking. Jouw inzichten kunnen helpen om beter te begrijpen wat er nodig is om technologie op een goede manier in te zetten. Er zijn geen goede of foute antwoorden. Alles wat je zegt is waardevol. Voel je dus vrij om eerlijk te zijn.

Even ter verduidelijking: wat bedoel ik met 'technologisch hulpmiddel'? Daarmee bedoel ik allerlei soorten technologie die cliënten kunnen ondersteunen in hun dagelijks leven, communicatie, mobiliteit of zelfstandigheid en hulpmiddelen die jij als begeleider helpen om de zorg beter of makkelijker te maken. Bijvoorbeeld: apps, aangepaste tablets, spraakcomputers, trilwekkers, slimme horloges, communicatietools, of software die speciaal voor mensen met een (visuele en/of verstandelijke) beperking is ontwikkeld. Maar ook veel tastbaardere producten zoals Paro,

CRDL, Moofie, de belevenistafel, het fietslabyrint vallen onder de term technologische hulpmiddelen.

Als jij tijdens het gesprek twijfelt of iets er wel of niet onder valt: stel die vraag gerust. Dan kijken we er samen naar.

Wat kan je dan verwachten? Het gesprek duurt ongeveer [20–30] minuten en bestaat uit twee delen. Vandaag is het eerste deel. Tussen de gesprekken zit wat tijd, zodat je eventueel later nog iets kunt aanvullen of laten bezinken. Het tweede deel doen we later en dan wil ik wat kleine ideetjes met je gaan bespreken, maar dat is voor later.

Dan als laatste wil ik nog benadrukken dat alles wat je zegt wordt vertrouwelijk behandeld. Je naam wordt nergens genoemd in de analyse of uitkomsten.

Introducing questions:

- Kun je kort iets over jezelf vertellen?
- Wat is jouw functie en hoeveel jaar werk je al in deze rol?
- Met welke doelgroep(en) werk je het meest?
- Op welke locatie werk je meestal?
- Hoe zou jij jezelf omschrijven als het gaat om technologie?
(Bijvoorbeeld: beginner, redelijk vaardig, heel handig / enthousiast / afwachtend)
- Als je jezelf een cijfer zou geven voor hoe vaardig je bent met technologische hulpmiddelen in je werk, welk cijfer zou dat dan zijn? (Schaal 1-10)
- Wat maakt dat je jezelf dat cijfer geeft?

Interview questions:

1. Eervaringen met leren

- Hoe leer jij nu meestal over technologische hulpmiddelen?
- Hoe leer jij het liefst over nieuwe hulpmiddelen?
- Kun je een voorbeeld geven van de laatste keer dat je iets nieuws leerde over een hulpmiddel?
- Hoe voelde dat moment voor jou?
- Wat werkte goed in dat leermoment? Wat werkte minder goed?
- Heb je ooit een training of uitleg gehad over hulpmiddelen? Wat vond je daarvan?
- Wat zou jou kunnen helpen om makkelijker of beter te leren over technologie?
- Stel, je mocht het helemaal zelf inrichten: hoe zou jouw ideale manier van leren eruitzien?

2. Collega's als kennisbron

- Waarom leer je liever van een directe collega dan via andere manieren?
- Hoe gaat dat leren van collega's in de praktijk?
- Kun je een voorbeeld geven van een keer dat je iets van een collega leerde?
- Wat maakt het fijn om naar een collega te gaan?
 - Is het sneller?
 - Is het omdat je direct een antwoord nodig hebt?
 - Is het omdat je diegene goed kent?
 - Voelt het veiliger om vragen te stellen aan iemand die je vertrouwt?
 - Is het minder spannend dan naar iemand van een andere afdeling?

3. Gebruik van ondersteunende bronnen

- Als je een vraag hebt over hulpmiddelen, waar of bij wie zoek je dan informatie?
- Gebruik je het Kennisportaal of SoVisio?
 - Wanneer was de laatste keer?
 - Hoe gebruik je het?
 - Wat vind je ervan?
 - Weet je waar je moet zoeken?
 - Wat maakt het makkelijk of moeilijk om er iets op te vinden?
- Waarom ga je niet (altijd) naar een Digicoach of afdeling Zorg & Technologie?
 - Weet je dat zij bestaan?
 - Heb je een idee wat zij voor je zouden kunnen doen?
 - Wat houdt je tegen om contact op te nemen?

4. Gebruik in de praktijk

- Gebruik jij momenteel technologische hulpmiddelen in je werk?
- Welke hulpmiddelen gebruik je zoal?
- Wanneer heb je voor het laatst iets gebruikt? Kun je dat moment beschrijven?
- Hoe voelde dat voor jou?
- Wat ging er goed, en wat was lastig?
- Hoe weet jij welke hulpmiddelen er zijn?
- Hoe voel jij je bij het gebruik van technologie in je dagelijkse zorgpraktijk?
- Zijn er dingen die je tegenhouden om technologie vaker te gebruiken?

5. Team en organisatiecultuur

- Hoe wordt er binnen je team gepraat over technologie?
- Wordt het gebruik ervan gestimuleerd of juist niet besproken?
- Voel jij je verantwoordelijk om op de hoogte te blijven?

- Is er iemand in je team of organisatie die als aanspreekpunt geldt?
- Hoe reageren collega's als iemand iets nieuws probeert?

6. Behoeften en ideeën

- Wat zou jou helpen om technologie makkelijker of vaker te gebruiken?
- Wat zou jou helpen om sneller hulp of informatie te vinden?
- Heb je ideeën over hoe collega's beter ondersteund kunnen worden?

7. Afronding

- Is er iets wat je zelf nog wil toevoegen over dit onderwerp?
- Heeft dit gesprek je ergens aan het denken gezet?

Afsluiting:

Dank je wel nogmaals voor je tijd en bedankt voor je openheid. Het helpt mij enorm om echt te begrijpen hoe het er in de praktijk aan toe gaat.

Soms komen inzichten pas achteraf. Als je nog ergens aan denkt of iets wil toevoegen, voel je vrij om contact op te nemen, of het in het volgende gesprek te benoemen. Elk inzicht telt.

Dit was het eerste deel van het interview — in het volgende gesprek ga ik wat ideeën voorleggen die gebaseerd zijn op wat ik van meerdere mensen hoor.

Nieuwe datum inplannen

Vragen om max 5 fotos te maken

Appendix E: Interview set-up presenting interventions

Purpose of the interview

The second interview served as a follow-up to the first interview and aimed to deepen the understanding of shared learning preferences among care professionals at Visio. Unlike the first interview, which focused on identifying barriers and experiences related to assistive technologies, this interview introduced multiple possible interventions. The goal was to explore participants' opinions on these concepts and assess their perceived relevance, feasibility, and potential impact within their work environment.

Interview approach

The interview followed a semi-structured format, similar to the first interview. A predefined set of questions (which can be found later in this chapter) provided structure, while flexibility was maintained to explore emerging topics in more detail. The interview built directly on the earlier conversation, allowing participants to reflect on previously shared insights and to react to newly introduced ideas and interventions.

Participants and preparation

The interview was conducted with the **same group of participants** as the first interview. Prior consent covered both interview sessions; however, participants were again reminded of the recording process, and an opportunity was provided to withdraw or raise additional concerns.

At the beginning of the session, participants were invited to reflect on:

- whether they had any new thoughts or additions since the first interview
- whether there were any urgent matters they wished to discuss
- their awareness and experiences with the board game referenced in Chapter 5

This board game was discussed to explore familiarity with existing tools and to understand how previously developed materials were perceived.

Interview setting and procedure

As with the first session, the interview was conducted online via **Microsoft Teams**, using the platform's built-in recording feature.

- **Duration:** approximately 45–60 minutes
- **Format:** one-on-one conversation with each participant
- **Setting:** online meeting environment
- **Recording:** automatic audio and video transcription through Teams

The interview consisted of three main parts:

Exploration of participant reflections and context

Participants were first asked to reflect on the previous interview and mention any new observations or ideas. The board game was briefly introduced to gauge familiarity and collect initial reactions.

Discussion of learning-related themes

Participants were then asked for their own ideas and experiences regarding the following topics:

1. Information and support
2. Time and work pressure
3. Doubting one's abilities and fear
4. Team and culture

These topics were chosen because they are recurring themes in learning behaviour and adoption of new practices within care settings.

Presentation and discussion of intervention concepts

Next, five preliminary intervention concepts were introduced, explained, and discussed:

1. **Technology Fest**
2. **Technology Ambassadors**
3. **Team Quiz with Submitted Questions**
4. **Step-by-Step Learning Game/App**
5. **Concerns and Complaints Wall**

Participants were encouraged to identify which elements felt promising, relevant, or necessary and which elements seemed unrealistic or unhelpful.

Sketches and visual concepts

Two slides containing an assortment of sketches and conceptual visualizations were shown. Participants were asked to comment on:

- ideas that appealed to them
- any elements they disliked or found confusing
- which concepts they believed would fit best within their team culture

The interview concluded with several wrapping-up questions, allowing participants to express final thoughts or concerns.

Automated transcription

The interview recordings were automatically transcribed using Microsoft Teams. As with the first interview, the raw transcripts contained inaccuracies such as incomplete sentences, misheard words, and structural errors.

Use of ChatGPT for structuring and summarizing

ChatGPT was used to support the processing and analysis of the transcripts. The **same prompt structure** was applied as in the first interview, ensuring

consistency across interviews. For each interview question, ChatGPT was asked to:

- extract key insights in bullet points
- identify one representative quotation
- summarize the responses per participant

After all responses were processed individually, ChatGPT was then used to generate a combined overview across participants for each question/theme.

Researcher validation and limitations

As in the first interview, ChatGPT's summaries were treated as preliminary guidance rather than final interpretations. Limitations included:

- an inability to distinguish between central insights and minor side remarks
- occasional overemphasis on less relevant statements
- omission of subtle but important nuances

To ensure accuracy, the researcher thoroughly reviewed and corrected each generated overview. This included:

- verifying the accuracy of summaries
- adjusting emphasis to reflect the actual focus of the participants
- ensuring quotes were accurate and representative
- adding missing key points based on the transcript

Ultimately, while ChatGPT supported the structuring of data, the final interpretation, thematic categorization, and synthesis were conducted manually by the researcher.

Interview 2

Introduction:

Fijn dat je er weer bij bent voor het tweede deel van ons interview. In het vorige gesprek hebben we het gehad over jouw ervaringen met technologische hulpmiddelen in je werk. Dat heeft mij veel waardevolle inzichten gegeven, nogmaals bedankt daarvoor.

Vandaag wil ik een stapje verder gaan. Ik heb een paar hele vroege ideetjes of schetsjes meegenomen, gebaseerd op wat ik tot nu toe heb gehoord. Ze zijn nog heel ruw en bedoeld als een startpunt om samen te verkennen wat wel of niet zou kunnen werken. Er is dus alle ruimte voor feedback, twijfels of nieuwe ideeën. Alles wat je denkt of voelt bij wat je ziet of hoort, is welkom.

Net als de vorige keer geldt: er zijn geen goede of foute antwoorden. Jouw reactie helpt me juist om beter te begrijpen wat wel of niet zou kunnen passen bij jou en je werk.

Ook nu wordt alles wat je zegt vertrouwelijk behandeld. Je naam wordt nergens genoemd in de analyse of in de uitkomsten.

Als je het toestemmingsformulier al hebt ingevuld, dan neem ik vanaf nu dit gesprek weer op.

Het gesprek zal ongeveer [30-40] minuten duren. Als je er klaar voor bent, kunnen we beginnen.

Allereerst wil ik je vragen of er bij jouw zelf nog dingen naar boven zijn gekomen die je met mij zou willen delen?

Heb je foto's van leermomenten kunnen maken? Kan je vertellen wat er op de fotos gebeurt?

Space for questions as a result of the first interview

Heb je al wel eens gehoord over het spel dat Paul heeft laten ontwikkelen?

Ik wil vandaag ideeën gaan bespreken die kunnen helpen om de kennis en inzet van technologische hulpmiddelen te verbeteren.

Heb jij daar misschien zelf al ideeën over?

Ik heb wat thema's in ons gesprek gevonden, ik zou graag horen of jij ideeën hebt voor deze thema's.

Informatie & ondersteuning

(zoals: onduidelijke systemen, informatie-overload, niet weten waar je moet zijn)

“Soms is het lastig om de juiste informatie te vinden over technologische hulpmiddelen. Wat zou jou daarbij kunnen helpen?”

Twijfel aan eigen vaardigheden & angst

(zoals: onzekerheid, angst om iets fout te doen, schaamte)

“Sommige mensen vinden technologie spannend omdat ze bang zijn iets verkeerd te doen. Wat zou dat minder spannend maken denk je?”

Tijd & werkdruk

(zoals: geen tijd om te leren, technologie voelt als extra)

“Als je al druk bent, voelt technologie er vaak bij. Hoe zou het tóch werkbaar kunnen worden in jullie dag?”

Team & cultuur

(zoals: geen gezamenlijke leercultuur, generatieverschil, alles komt op enkeling neer)

“Wat zou jouw team kunnen helpen om technologie vaker samen te bespreken of samen te proberen?”

This set of questions were the guidelines used for each of the next five ideas

1. Eerste indruk

Wat vind je van dit idee?

Wat voel je erbij?

2. Herkenning en aansluiting

Zou dit kunnen passen in jullie team? Waarom wel of niet?

Zie je dingen die botsen met hoe jullie nu werken?

3. Verwachte effectiviteit

Denk je dat dit medewerkers zou helpen om meer met technologie te doen?

Waarom wel of niet?

4. Drempels of bezwaren

Wat zou maken dat jij of je collega's hier niet aan mee zouden doen?

Wat zou je ervoor nodig hebben om dit met vertrouwen te doen?

5. Verbetersuggesties

Wat zou jij veranderen aan dit idee om het beter te laten passen?

6. Vrije reflectie

Roept dit idee nog andere gedachten op over hoe het anders of beter zou kunnen?

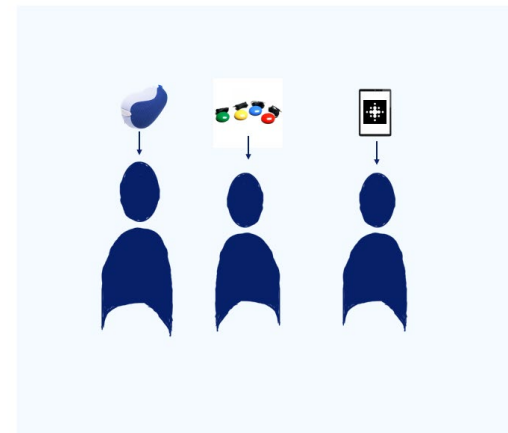
Idee 1. Festival / Markt



Festival / Markt

Festival waar medewerkers, cliënten en familie samen technologie ervaren

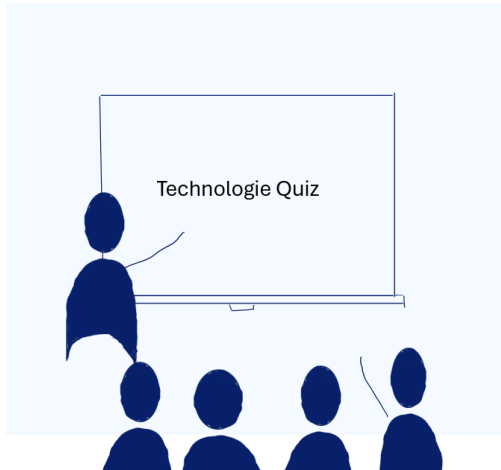
Idee 2. Technologie-ambassadeurs



Technologie-ambassadeurs

Medewerkers nemen verantwoordelijkheid over één hulpmiddel

Idee 3. Teamquiz met ingezonden vragen



Technologie Quiz

Medewerkers sturen vragen in, quiz tijdens teamoverleg

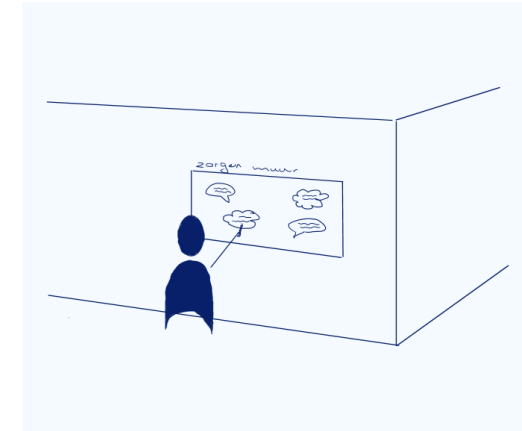
Idee 5. Zorgen, klachten en vragenmuur

Zorgen- en Klachtenmuur

Medewerkers kunnen anoniem zorgen over technologie delen

Vragenmuur

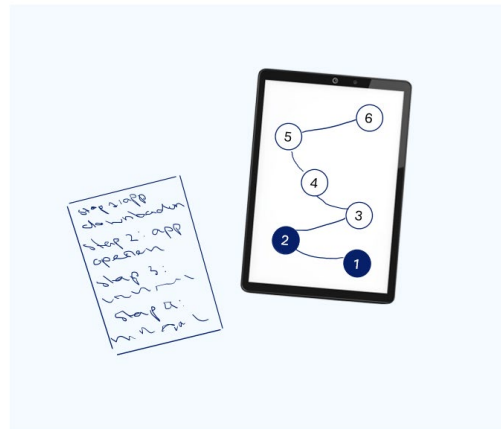
Medewerkers kunnen een vraag over technologie achterlaten op het bord en andere medewerkers kunnen daarom reageren



Idee 4. Stapsgewijs leer-spel / app

Stapsgewijs leer-spel / app

Spel/app die medewerkers helpt van basis- naar gevorderde technieken



Ik ga nu een overzicht van meerdere ideeën laten zien. Je mag kijken welke er voor jouw uitspringt of we er nog meerdere bespreken.

Mogelijke vragen om verder op in te gaan:
Wat maakt dat je dit idee er tussen uit pikt?

1. Herkenning en aansluiting

Zou dit kunnen passen in jullie team? Waarom wel of niet?
Zie je dingen die botsen met hoe jullie nu werken?

2. Verwachte effectiviteit

Denk je dat dit medewerkers zou helpen om meer met technologie te doen?
Waarom wel of niet?

3. Drempels of bezwaren

Wat zou maken dat jij of je collega's hier niet aan mee zouden doen?
Wat zou je ervoor nodig hebben om dit met vertrouwen te doen?

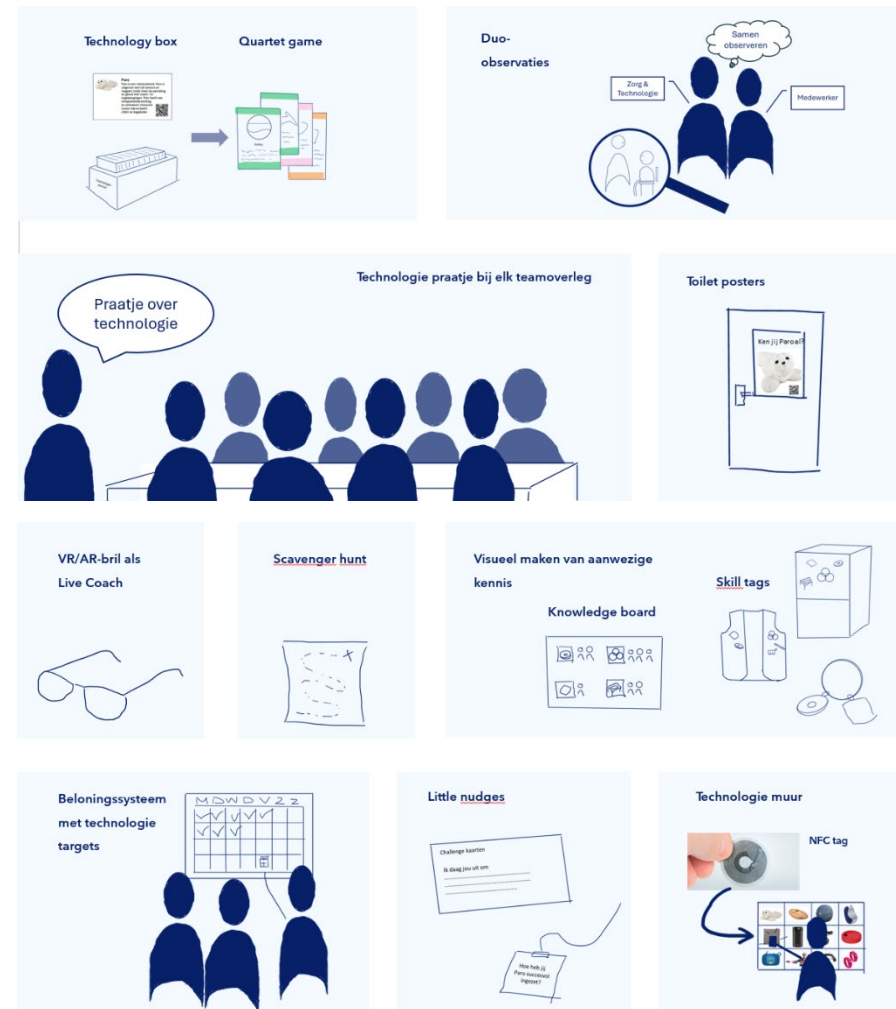
4. Verbetersuggesties

Wat zou jij veranderen aan dit idee om het beter te laten passen?

5. Vrije reflectie

Roept dit idee nog andere gedachten op over hoe het anders of beter zou kunnen?

The following slides were shown in this part of the interview



Afrondende reflectie

1. Welk idee sprak je het meest aan? Waarom?
2. Welk idee sprak je het minst aan? Waarom?
3. Denk je dat één van deze ideeën echt iets zou kunnen veranderen in jullie team?
4. Zou je zelf nog een idee willen toevoegen?

Afsluiting:

Bedanken voor tijd en het open zijn. Heel veel inzichten gekregen
Vragen of evaluatie ook met deelnemer mag?
Leuk om op de hoogte te blijven?
Leuk om betrokken te worden bij de eindpresentatie?