This presentation is part of the COGAIN Deliverable D3.4

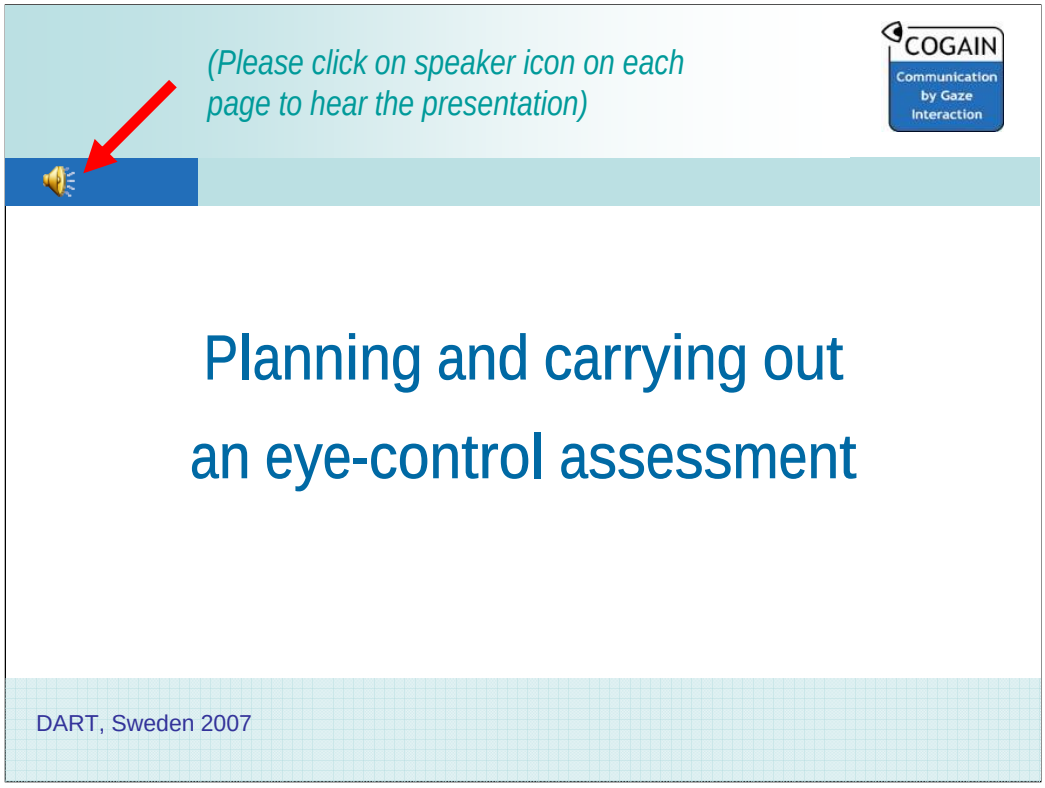
Eye Control Hints and Tips

by

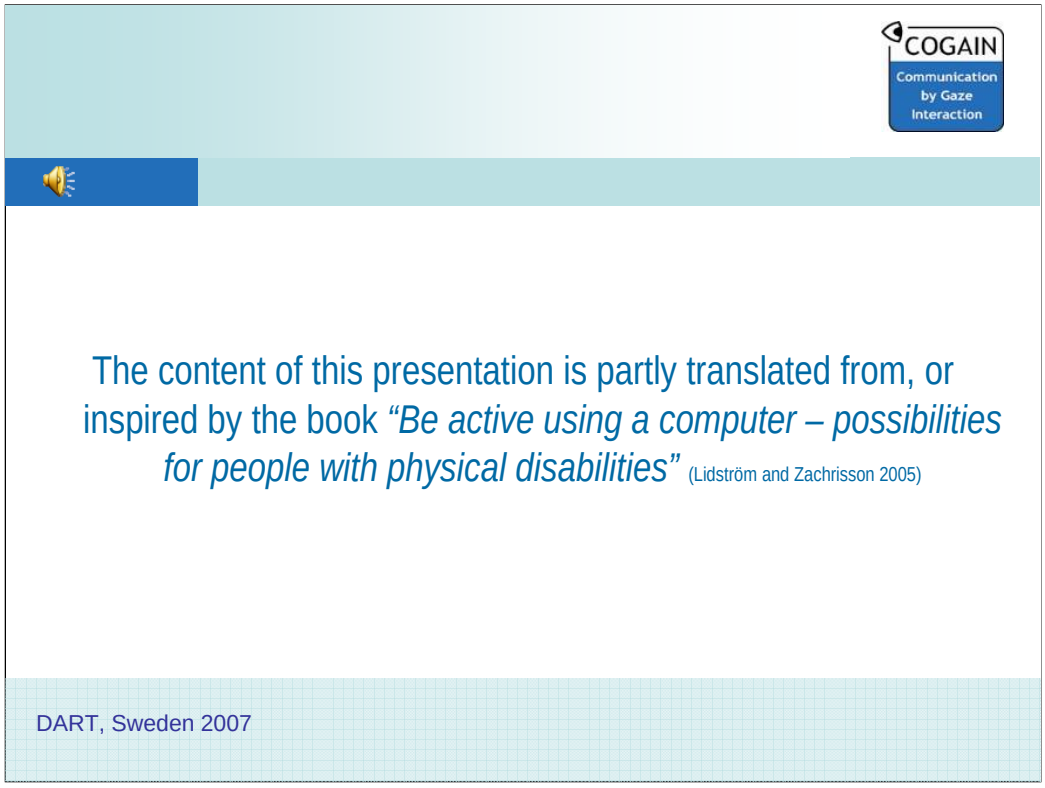
the Network of Excellence on

Communication by Gaze Interaction

www.cogain.org



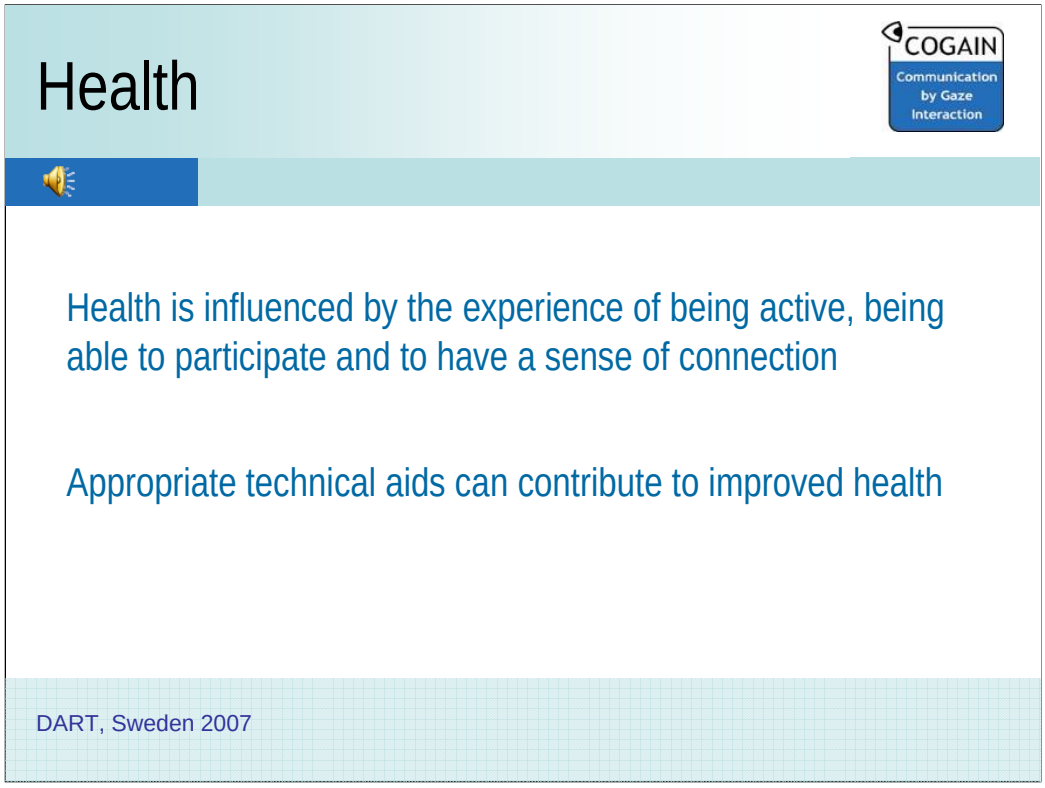
Planning and carrying out an eye-control assessment



The content of this presentation is partly translated from, or inspired by the book *"Be active using a computer – possibilities for people with physical disabilities"* (Lidström and Zachrisson 2005)

Introduction

When carrying out an eye-control assessment it's important to analyse the characteristics of the eye gaze system that you are using, and to find out what the user wants to use the technology for.



Health

Health is influenced by the experience of being active, being able to participate and to have a sense of connection

Technical aids can contribute to improved health

•Participation means to take part in meaningful activities and purposeful tasks, interacting with the environment

•A persons satisfaction with life depends on how well he/she is able to achieve participation and perform meaningful activities

•A client centred approach is a basic condition for self-determination and the empowerment of the user

Teamwork

- Good teamwork is important in assessments and other areas of assistive technology.
- Every member of a team contributes with his or her knowledge.
- The aim must be to establish a good collaborative relationship between the user and the team members and work towards a common goal.

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-Teamwork is important in assessments and other areas of assistive technology. The composition of the team should be based on the outcomes which the team are aiming to achieve for the individual user.

-Every member of a team should be able to contribute with his or her knowledge on an equal basis. The addressed issues must be concrete and describe the limitations in daily life of the user.

- The aim must be to establish a close cooperation between the user and the team members and work towards a common goal. The interview and discussions with the user must be adapted to the cognitive and physical abilities of the user.

- The user (with help from the team) decides which issues and activities that are most important.

- Never dismiss a users wish to be able to perform a certain activity even though it might seem impossible at the time!

Motor assessment

A good assessment for access to technology should result in a list of useful motor functions and should include the users' opinion about this.

Good questions to be asked are:

- Is there a motor function that would be useful for a mouse click?
- What is the users' level of strength and coordination?
- What is the best working position?

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- An assessment for access to technology should result in a list of useful motor functions. The user often has an opinion about this.

It's recommended that the motor assessment is made by a physiotherapist or an occupational therapist, together with an interview with the user in collaboration with family or those supporting the user, as appropriate.

Issues for consideration include:

•Is there a motor function that would be useful for mouse click?

(This could be any deliberate movement wheter by hand, leg, foot, head or other physical control)

-What is the users' level of strength and coordination?

-What is the best working position?

-Is sitting or lying preferred? Does the user need an adapted sitting position? (see information package about ergonomics for more information)

The pictures show a foot switch and a hand switch that can be used for mouse click.

Other questions one should ask:

- Does the user have any visual problems?
- How is the control of eye movements?
- Are there other things that might affect use of eye gaze - like problems opening the eyes, squinting, nystagmus etc?
- Along with the motor assessment it is important to gather information on other aspects like hearing, cognition, literacy skills, etc.
- Which of the strengths can we use to overcome the difficulties?

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- Does the user have any visual problems?

It can be possible to use eye gaze systems even though having visual problems.

- How is the control of eye movements?

The user needs to be able to control his or her eyes to some extent. If not able to look at the hole screen it's possible to adapt the system to that.

- Are there other things that might affect use of eye gaze, like problems opening the eyes, squinting, nystagmus etc?

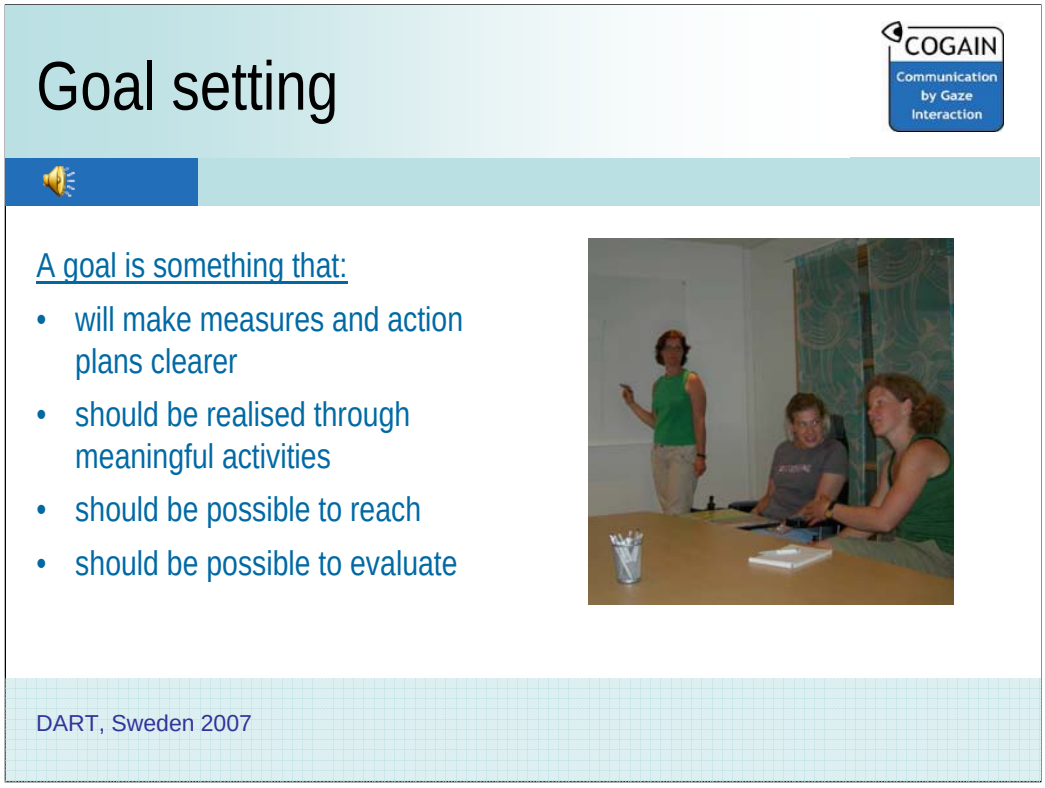
Some systems can function anyway, though it's important to map the users functions.

(see information package about eye control for more information)

- Along with the motor assessment it's important to add other aspects like hearing, cognition, literacy skills, etc.

This information is gathered in interviews with the user and his or her environment and if possible medical journals

- Which of the strengths can we use to overcome the difficulties?



Goal setting

A goal:

will make measures and action plans clearer. If possible, the user should define the goals, and the problems discussed earlier should affect what goals are set.

A goal:

Should be realised through meaningful activities and are written down in present time.

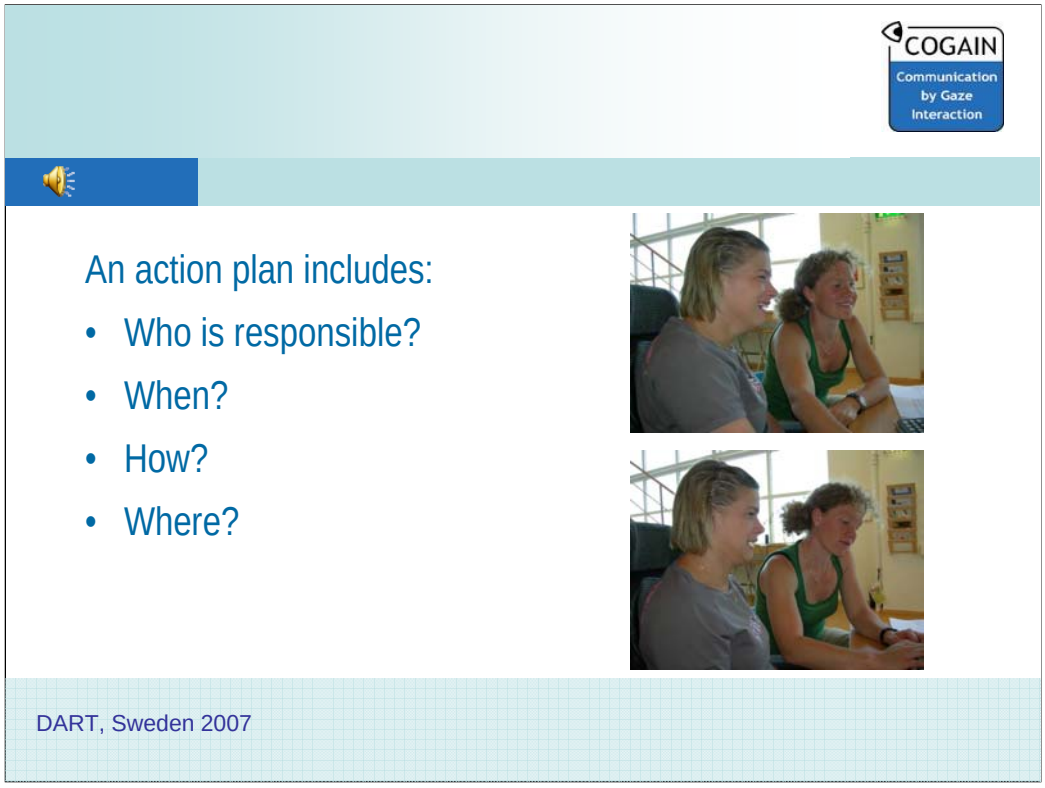
A goal:

should be possible to reach. Long term goals should be broken down into smaller ones.

A goal:

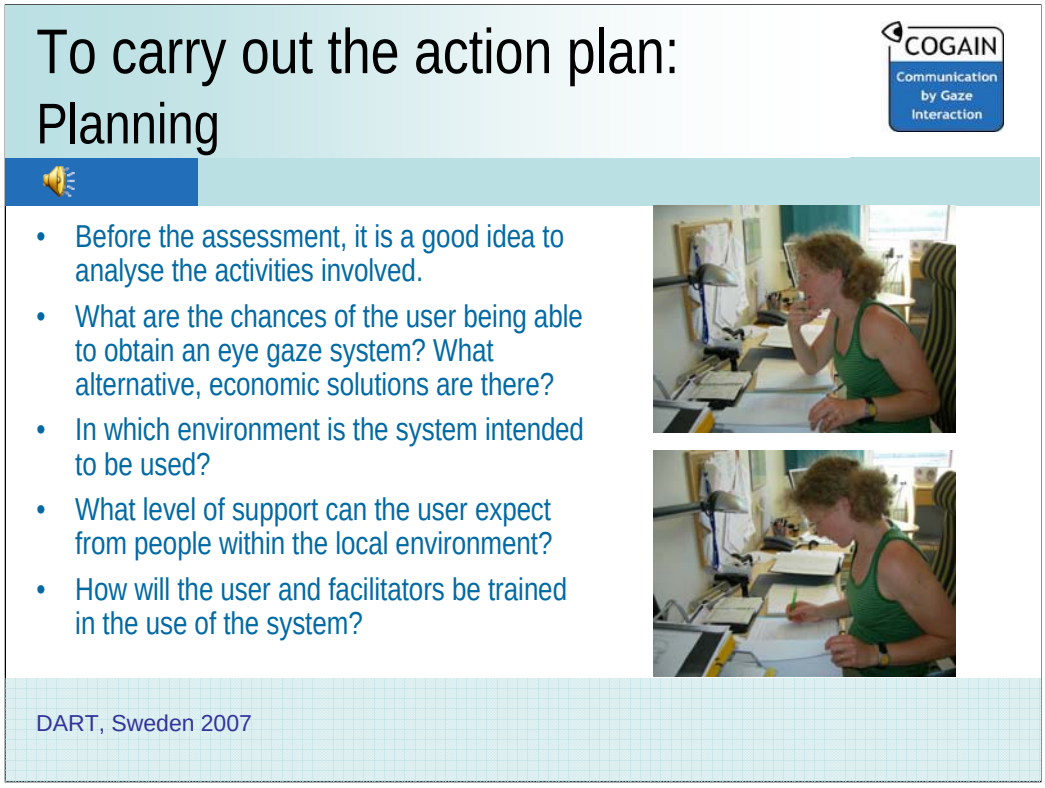
should be possible to evaluate. The goals affect further actions and are the basis for evaluation.

An example of a goal can be: Marika writes e-mails to her sister without assistance.



Make an **action plan,** including who's responsible for each part , as well as when, where and how the actions will be carried out.

Consensus with the user and his or her environment is the foundation of a good result!



To carry out the action plan:

Planning

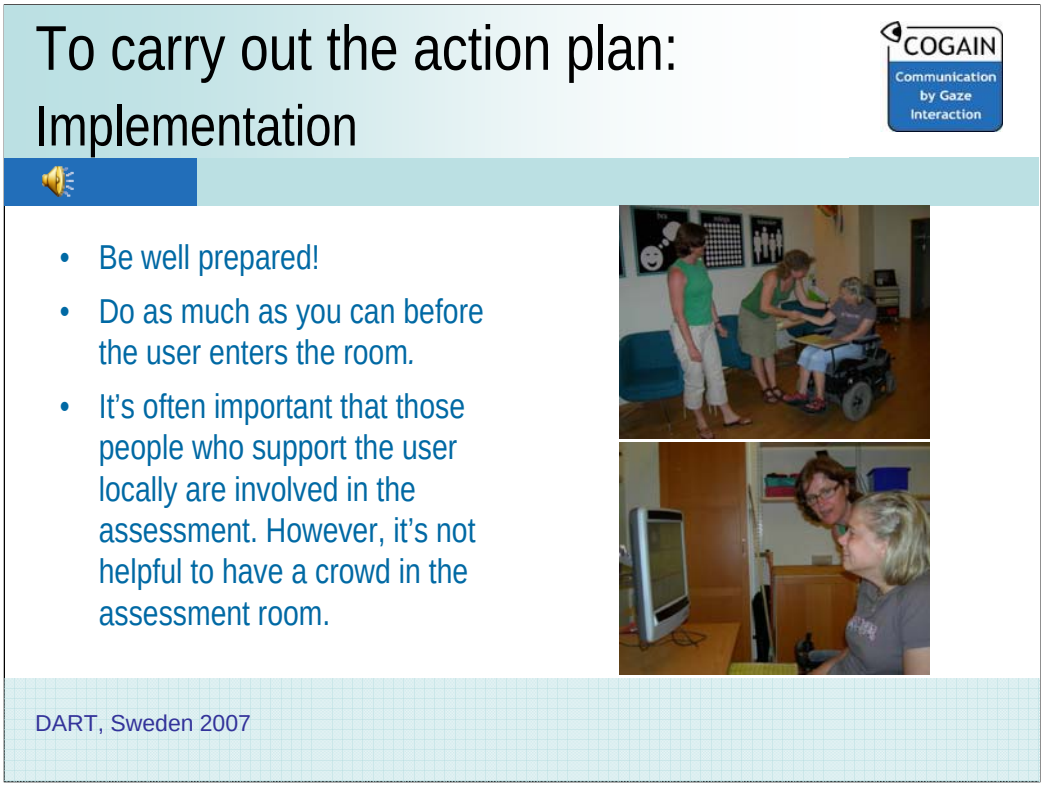
- Before the assessment, a good advice is to analyse the activities involved. Describe the activity in one or two sentences in terms of complexity and how complicated or easy it is. What different equipment, material or other things are needed?

- What are the chances of the user being able to obtain an eye gaze system? What alternative, economic solutions are there? This is of course different in every country.

•In which environment is the system intended to be used? How well can the system work in this environment? Are changes necessary?

•What level of support can the user expect from people within the local environment, like family, friends or staff?

•How will the user and those supporting the user be trained in the use of the system? It's very important that everybody involved gets proper training! Make a plan for how this will be achieved.



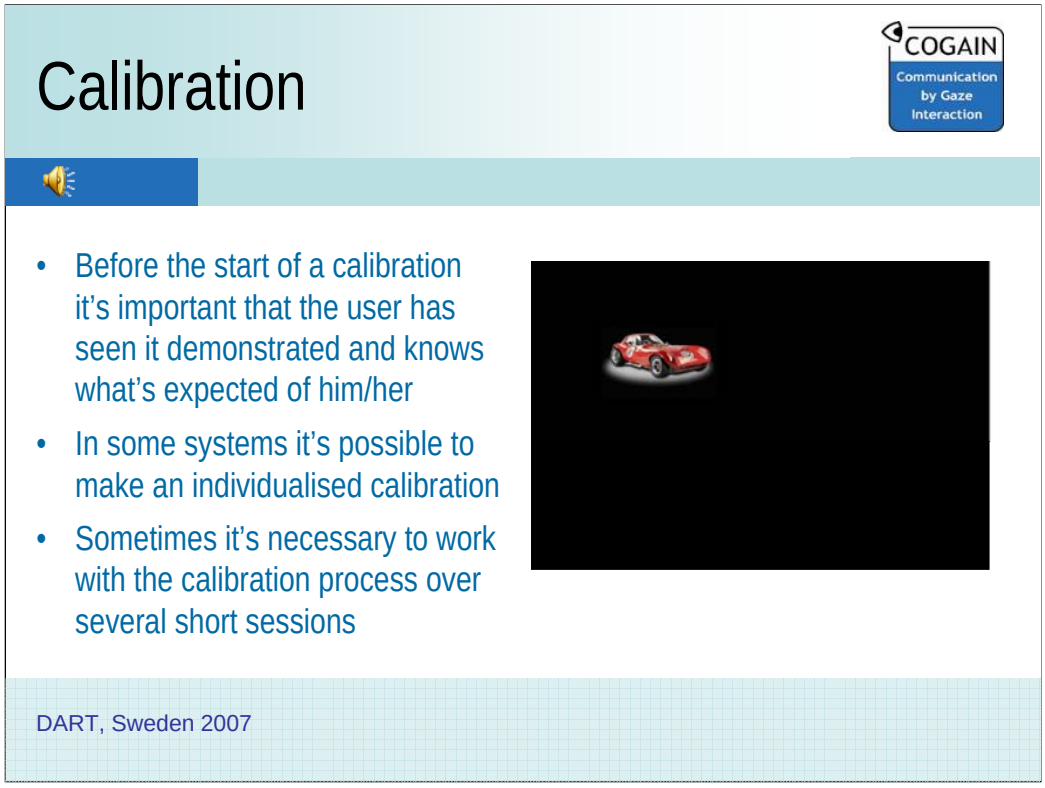
To carry out the action plan:

Implementation

- Be well prepared! Try the system and different software yourself! This will make it easier for you to know the demands on the user and helps you adapt the activity to the right level.

- Have everything arranged and in order, before the user enters the room: the computer started, speakers at a comfortable volume, printer started,calibration ready to start. Clear the computer desktop of unnecessary information.

- It's often important that essential persons in the users' environment are involved in the assessment. However, it's not recommended to have a crowd in the assessment room. The user must be able to concentrate and mustn't feel under any pressure. Video recordings and photos can give others a possibility to take part without being present. Some assessment rooms have a one way screen or cameras and monitors making it possible to follow the assessment from another room.

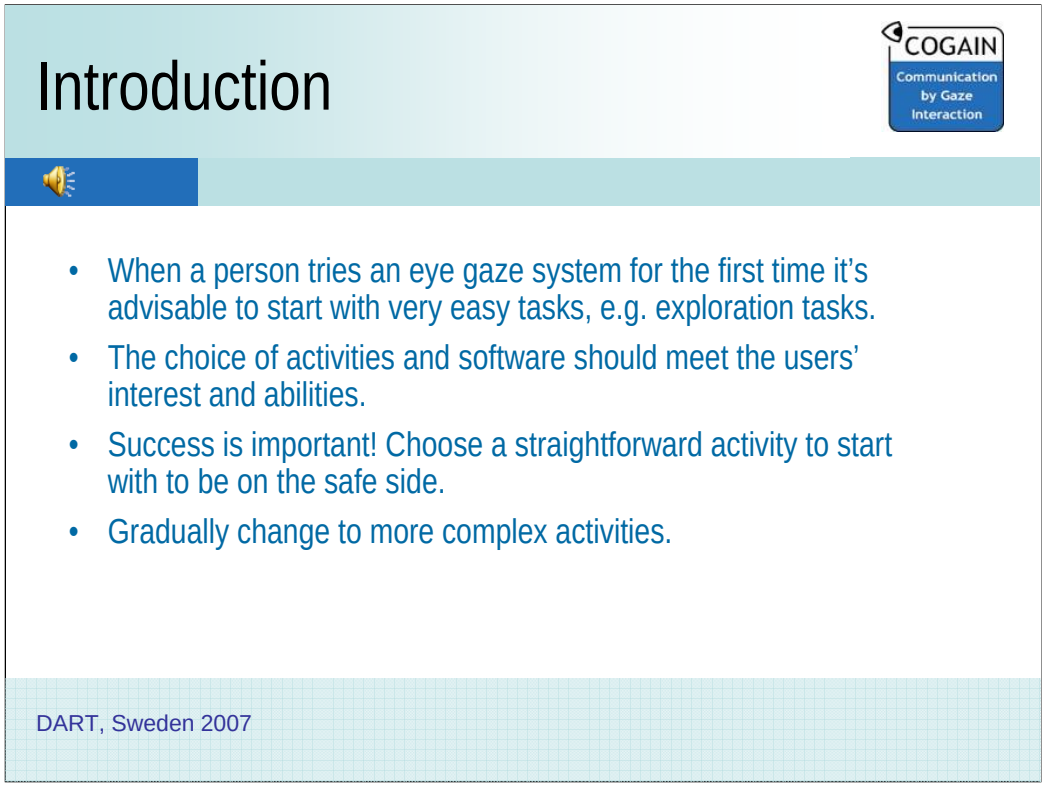


Calibration

- Before the start of a calibration it's important that the user has seen it demonstrated an knows what's expected of him/her.

-In some systems it's possible to make an individualized calibration, where it's possible to change size, colour, location and amount of targets. In some systems it's possible to use your own pictures, sounds or film clips. This is very useful for children, persons with developmental disabilities or problems with attention.

- Sometimes it's necessary to work with the calibration process over several short sessions.



Introduction

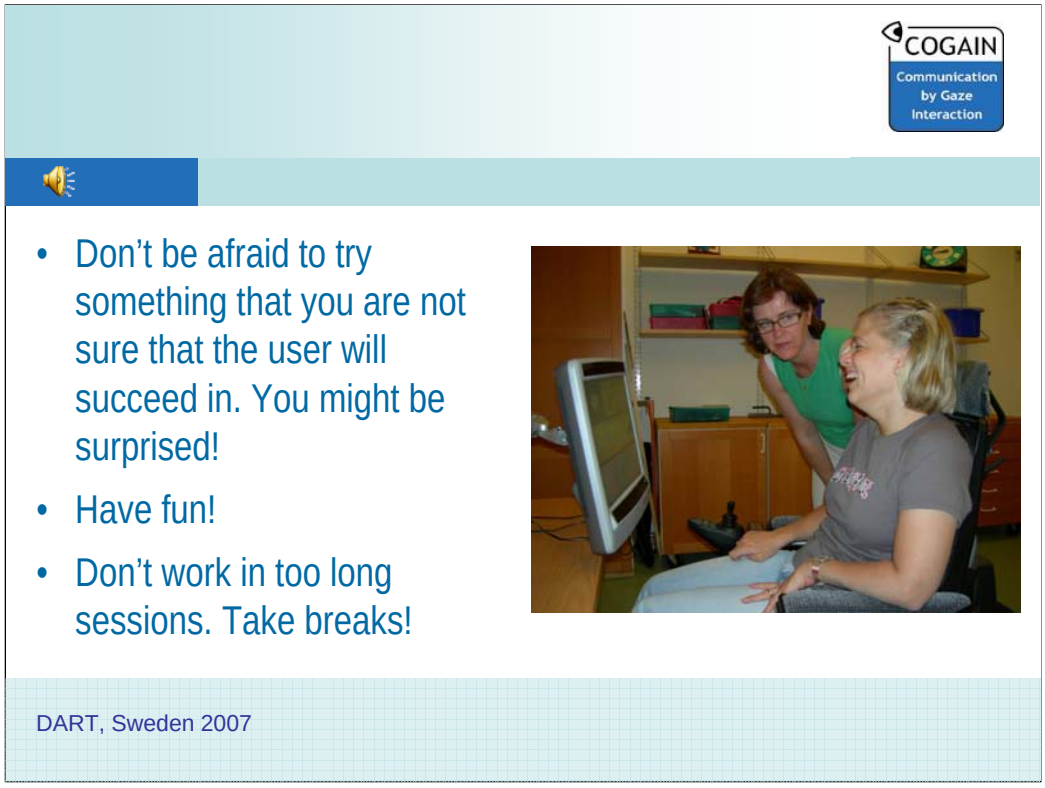
•When a person tries an eye gaze system for the first time it's advisable to start with very easy tasks. Preferably with a type of activity where a choice only generates a sound. It is essential during the early stages for the user to be presented with activities that enable him/her to build up their skills with this new medium without making misstakes.

- To be able to succeed, the choice of activities and software must meet the users' interest and abilities. If the demands on the user are to high or to low, the user might loose interest and motivation.

- Success is important! Choose a straightforward activity to start with to be on the safe side. A non complex activity does not necessarily mean that it is childish!

•Gradually change to more complex activities. Have some different activities prepared so that you easily can change if the results are better or poorer than expected.

(see information package about software and activities for more information)



- Once the user feels comfortable with the idea of eye control, don’t be afraid to try something that you are not sure that the user will succeed in. You might be surprised!

It’s important to give the user all opportunities available!

- Have fun!

Having fun while learning speeds up the learning process and makes the user much more motivated.

- Don’t make a session too long. Take breaks!

Be aware of signs of fatigue – working to hard will only result in mistakes and therefore a lack of motivation. End the session before this occurs.

Comparison of access methods

- To make a comparison between different computer access methods or settings, the user could complete the same task using the alternative methods or settings, while a score is kept on time and errors.
- Sometimes the best solution may be to use different access methods for each different activity.

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- To make a comparison between different computer access methods or settings, the user could complete the same task using the alternative methods or settings, while a score is kept on time and errors.

This way one can get a more objective measure on what's most effective. The most important information though is the opinion of the user!

- Sometimes the best solution is to have different access methods for different activities.

Independence

Most users want to be as independent as possible.

- Can the user move to the system independently?
- Can the user start up and handle the system?

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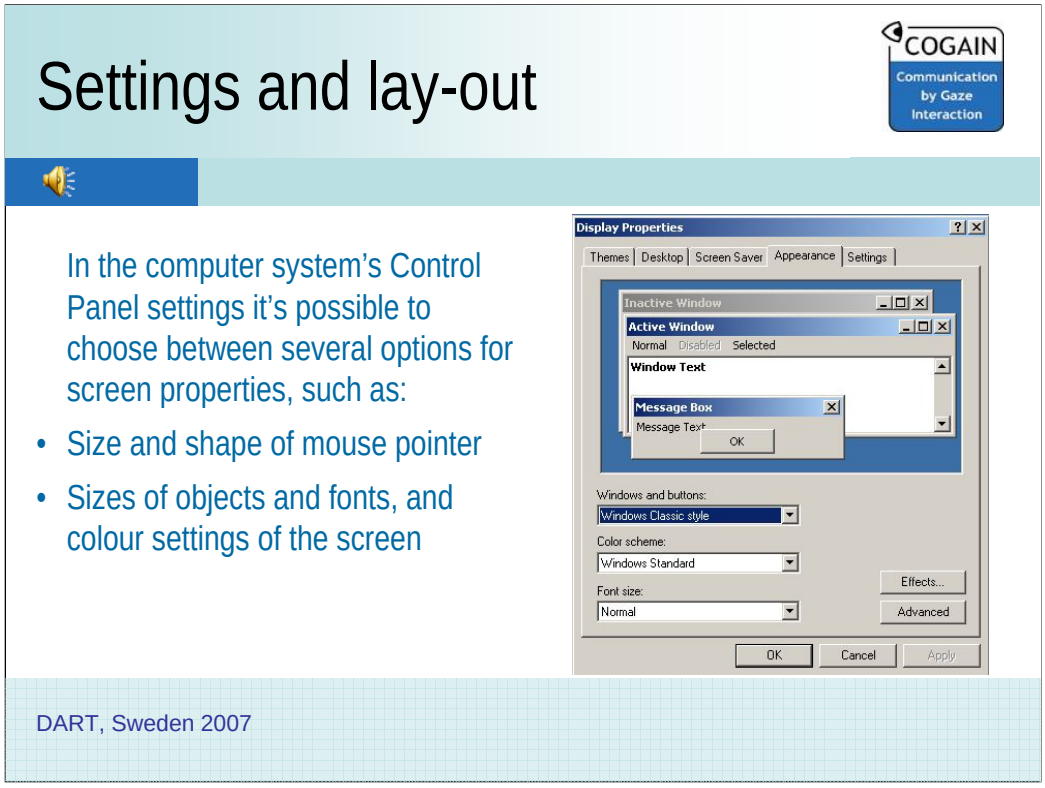
Most users want to be as independent as possible.
That's why it's good to note the following:

- Can the user move to the system independently? Shall the equipment be moved to another place or some furniture be moved?

- Can the user start up and utilise the system independantly?

(Remember to use auto start when needed!)



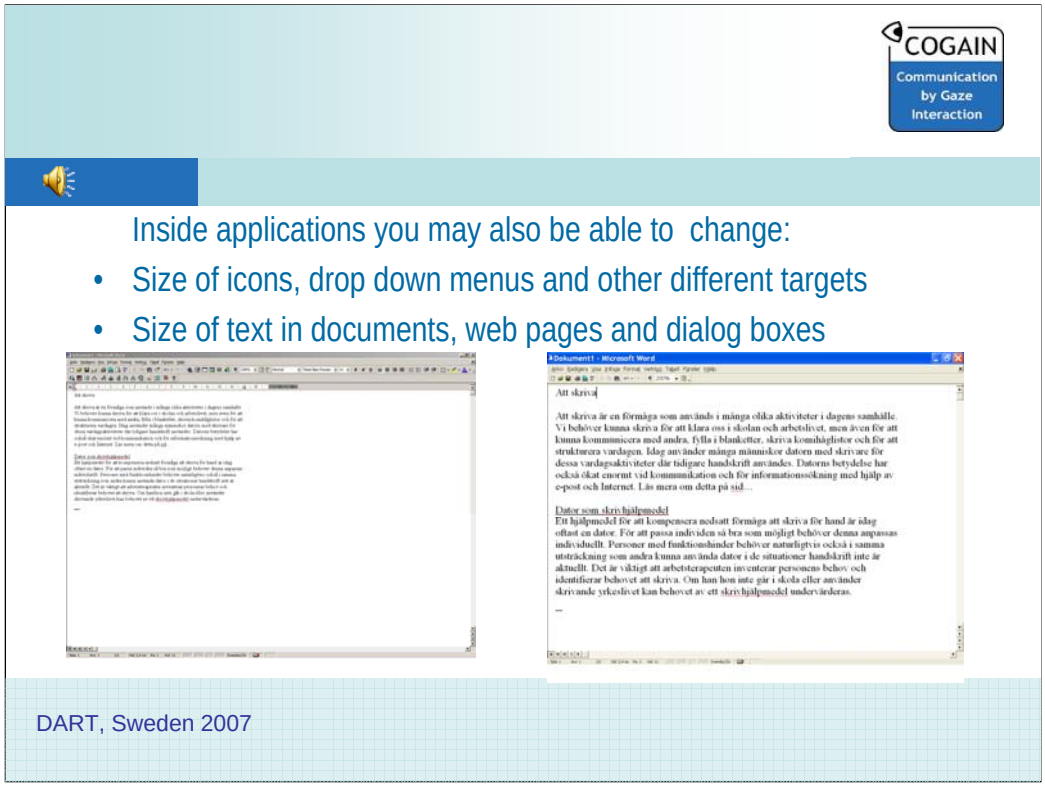
Settings and lay-out
In the computer system's Control Panel settings it's possible to choose between several options for screen properties, such as:

- Size and shape of mouse pointer
- Sizes of objects and fonts, and colour settings of the screen

This can make it easier for the user to se and target small objects.

Picture:

The picture shows Windows Display properties where some changes can be made.



Inside applications you may also be able to change:
- Size of icons, drop down menus and other different targets, as well as the size of text in documents, web pages and dialog boxes

Go through the settings in the operational system and see what different possibilities there are!

Picture:

The pictures shows screen shots of a regular Word lay-out and a more easy to read lay-out with fewer and larger targets.

Evaluation

It’s essential to make a thorough evaluation together with the user to find out if the goals are reached, or if there is a need of further assessment.

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It’s essential to make a thorough evaluation together with the user to find out if the goals are reached, or if there is a need of further assessment.

Talking Mats™ (Murphy and Cameron 2006) is an example of a good evaluation tool for users with communication problems.

Here a user is evaluating the assessment together with the occupational therapist.

Don’t get lost among all the possible technical solutions!
The most important thing for the user is that the system works, is reliable and demands a minimum of maintenance.

It doesn’t matter how good a system is in theory.
In practice, it must be as easy to use as possible,
be reliable and functional, with minimal support, in the user’s daily life!

Picture:

Here you can see Marika communicating using an eye gaze frame. There will always be a need of well functioning low tech alternatives, for situations when the eye gaze system is not available, for example at the beach or while eating.

References:

- Lidström, H. and G. Zachrisson, Eds. (2005). Aktiv med dator - möjligheter för personer med rörelsehinder. Stockholm, Hjälpmedelsintitutet.
- Murphy, J. and L. Cameron (2006). Talking Mats. A Resource To Enhance Communication. Stirling, Scotland, University of Stirling.

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