Technology related risks

There are multiple risks involved in a project where technical solutions are developed. For the technical risks, most of the risks are of a prevention nature and are intended to be used during development. The solutions proposed should be implemented to avoid those risks.

The risks are assessed with the help of a matrix with two four-graded scales. The vertical scale assesses how likely it is that the risk occurs. The horizontal scale tells us how serious the impact is, if it does occur. The matrix then gives us a score for each combination. Those scores can be labeled in five steps from very low to very high.

		Impact			
		How severe would the impact be if risk event occurred?			
		1 Insignificant	**2 Minor**	**3 Significant**	**4 Major**
Likelihood	**4 Likely**	Medium 4	High 8	Very high 12	Very high 16
What is the chance of the risk occurring?	**3 Moderate**	Low 3	Medium 6	High 9	Very high 12
	2 Unlikely	Very low 2	Low 4	Medium 6	High 8
	1 Rare	Very low 1	Very low 2	Low 3	Medium 4

Usability

Risks	Likelihood	Impact	Risk score	Proposed solution
Products do not follow universal design sufficiently	2	2	Medium 4	Developers follows Web Content Accessibility Guidelines
Manuals/helps are not easy to read	2	3	Medium 6	Add manual in accessible format (images, easy-to-read text, speech output)
Information on screen is not easily understood or meaningful to the user	1	3	Low 3	Enhance information with image, text and speech
Systems have not enough tolerance for error	2	3	Medium 6	Allow different ways of managing the system and present an easy way to stop or cancel an action
System error messages are not clear	2	3	Medium 6	Improve messages so that they relate to the problem and inform of solutions
Systems require too much physical effort	1	3	Low 3	Make sure navigation and design are compatible with alternative access methods
Interface components are not large/visible/positioned widely enough	2	3	Medium 6	Make sure users can customize their preferences to re-arrange components' size and position
Systems are not easy enough to learn	1	3	Low 3	Provide accessible information about the functions, e.g. "mark the text and click the mouse to activate speech"
Tasks in systems require too many steps for the user	1	2	Very low 2	Try to minimize the number of steps for each task
System is not beneficial enough to make the users actually want to use it	1	4	Medium 4	This depends on the user experience, so the solution is to make sure the system is stable and easy to use
System is not accessible for different access methods	2	3	Low 3	Make sure the system is following accessibility guidelines (WCAG)
System does not provide enough accessible and various output formats	2	3	Medium 6	Have a wide range of alternative outputs and allow customization
The user’s needs are not in the center of the system	1	3	Low 3	Involve peer researchers and test users and iterate solutions according to their opinions

Stability

Risks	Likelihood	Impact	Risk score	Proposed solution
Engines fail or crash often	1	4	Medium 4	Developers have to control the system regularly and fix possible bugs
Reasoning parts of a system stores, predicts or assesses participants' needs incorrectly	2	2	Medium 4	It has to be easy to turn off unwanted functionality that is proposed
Profiles created reflect the participant's needs incorrectly or "insensitively"	2	2	Medium 4	It has to be easy to turn off unwanted functionality that is proposed
Back-end system to adapt profiles manually fails to override automatic settings	1	4	Medium 4	Make sure manual settings always have a higher priority than automatic ones
Implemented technology becomes obsolete because of future technical advancements	2	2	Medium 4	Partners follow development closely and react to changes. Framework architecture should be flexible.
Cloud server performance is unstable	1	4	Medium 4	Developers will migrate to a different cloud service that offers the desired stability
Too many users will result in bad cloud server performance	2	4	High 8	Developers can increase the computational power of the cloud server. If this is not enough, then additional instances can be added. However the architecture needs to be adapted to support this.

Privacy and data collection

Risks	Likelihood	Impact	Risk score	Proposed solution
Unnecessary data was collected by the system	1	1	Very low 1	All data collection and treatment must follow European regulation. If a risk occurs, this will be reported to a data protection officer who will handle this accordingly.
Data is stored for an unnecessarily long time in the system	1	2	Very low 2	
Data is not stored securely enough by the system	1	4	Medium 4	
A third party had access to data without consent	1	4	Medium 4	
Data from tracking and browser history is used inappropriately or not protected	1	4	Medium 4	
Information that can identify users will be stored (single pieces or several together)	1	4	Medium 4	Partners must comply with GDPR and not collect unnecessary data. Much of the data collection will be encrypted and anonymized
Identifiable user details are sent to a third party	1	3	Low 3	Information may be sent to third parties but this information will be anonymized and in no way tied to specific users.
Database with sensitive data can be hacked	1	4	Medium 4	Database should only accessible from the server, only hashed value of user login should be stored with encryption, investigate possibility to use TDE
Communication between cloud and client can be hacked	1	4	Medium 4	TLS should be used (HTTPS and WSS)
Collecting data for statistical purposes may reveal data that can identify users	1	4	Medium 4	Statistics should be collected on a group level and user data be anonymized
Collection or capturing of information regarding disability may identify users	2	4	High 8	The information needed may instead be collected as preferences and needs

Autonomy

Risks	Likelihood	Impact	Risk score	Proposed solutions
System cannot be turned on and off at any time	1	2	Very low 2	Make sure the toolbar can be closed and opened easily by the user when the system is active - and easy to log out completely
User cannot easily deactivate that the system tracks e.g. web history	1	2	Very low 2	Make sure it is transparent when the system tracks, and make tracking optional
User cannot use system autonomously	2	3	Low 3	Make it easy for carers to assist at a distance

Accessibility

Risks	Likelihood	Impact	Risk score	Proposed solution
Systems do not include all users	4	2	High 8	Strive to fit as many as possible, such as persons having additional impairments
Insufficient back-end functionality to provide own alternative output	2	2	Medium 4	Make sure the system is compatible with as many additional resources as possible
System cannot be afforded by some users	1	3	Low 3	Make sure the system is open source and available freely for end users
Systems are not supported equally for all languages intended	4	3	Very high 12	Try to implement back-end solutions or compensatory functionality for languages with less support. Offer opportunities for third parties to add to the engines in additional languages.

Transparency

Risks	Likelihood	Impact	Risk score	Proposed solution
System's limitations and weaknesses are not transparent to users	3	2	Medium 6	Provide clear information about what the system can do, how, when and why
System's handling of data is not transparent to users	3	1	Low 3	Provide clear information about what data is collected and why, and let the user consent
Features of the system are not transparent for the user	1	3	Low 3	Provide clear information about what the system can do, how, when and why
Users are excluded from full/true content when a conversion is done (e.g. simplified text, dictionary lookups)	2	3	Medium 6	Tools that transform content must only be used if they are checked carefully that they don't restrict or mislead the user. Purposeful restriction of content must be made carefully and with good reason (e.g. exclude too much noise and enhance the user experience)