

# Inclusive digital design for people living with dementia

## DEMIGNED Principles

To overcome barriers digital design should include\_



### Cognition

- Monitoring of user's progress
- Tutorials with short instructions
- Adjustable functionalities and actions
- Easy navigation to functions and content
- Representative and understandable icons



### Perception

- Visually compartmentalized user-interfaces
- Appropriate system feedback
- Distinguishable colours
- Distinguish between clickable and non-clickable areas
- Visibility and readability



### Frame of mind

- Continuous support
- No time pressure
- Positive feedback for correct action completion
- Adjustable app settings to personal preferences
- Attractive and respectful content



### Speech and language

- Understandable words and sentences that feel comfortable
- Options for speech and text input

# Cognition

### Monitoring of user's progress

---

- Implement checklists to support successful completion of daily actions such as symptom monitoring or medication reminders
- Mark progress by providing a step-by-step linear approach of actions to take
- Implement auto-prompt feature to remind task completion
- Implement configurable reminders to support system use
- Minimize steps for data entry to prevent cognitive overload and ease progress tracking
- Auto-save functionality
- Confirm successful task completion

### Tutorials with short instructions

---

- Tutorial at start mobile app usage for user-guidance
- Simple step-by-step tutorials throughout
- Show limited information on a single screen to prevent cognitive overload
- Provide and repeat instructions
- Break instructions into multiple simple steps
- Filter irrelevant information when a subset of functionalities is used

### Adjustable functionalities and actions

---

- Implement adaptation of task difficulty
- Allow adaptation of sets of functionalities to each individual's cognitive abilities
- Provide simple items with potential to get more information on that item

### Easy navigation to functions and content

---

- Avoid strong hierarchical menu structures
- Allow to select one control method (e.g., "drag and drop" or "tap")
- Provide linear navigation rather than a hyper textual structure

### Representative and understandable icons

---

- Buttons should look like actual buttons
- Provide visualizations after successful task completion
- Consistent use of generally intelligible symbols on buttons
- All icons should be visible on the home screen to prevent scrolling

# Perception

### Visually compartmentalized user-interfaces

---

- Use bold colours to compartmentalize content in a user-interface
- Mix typography and iconography
- Use headings and subheadings
- Use standardized rules (colours, sizes, text) for labelling buttons and icons
- Differentiate objects from other visual features

### Appropriate system feedback

---

- Implement text-to-speech module
- Provide audio-based cues such as volume changes or button activation
- Provide vibrations for notifications
- Provide text-based instructions

### Distinguishable colours

---

- Use clear, colour-neutral, distinguishable colours to improve readability
- Avoid the use of excessively glaring colours in images, graphics and depictions
- The colour of components should contrast with the background

### Distinguish between clickable and non-clickable areas

---

- Provide simple intuitive distinction between click-sensitive and non-click-sensitive areas
- Implement audible beeps as system feedback to confirm an action on a click-sensitive area

### Visibility and readability

---

- Options to magnify elements such as buttons, graphics, and text
- Use large font size
- Implement “touch interface screen readers” to hear elements like buttons, graphics, tables, and text
- Automatic enlarging of captions and graphics when user-screening occurred
- Increase size of reminder pop-ups to a quarter of the screen and increase when interacted with
- Implement auto-brightness of screen to enhance readability

# Frame of mind

### Continuous support

---

- Ensure continuous support, for instance through a helpdesk. This can be initiated through the action bar or a panic button
- Implement mechanisms to recover from errors smoothly, such as an undo button

### No time pressure

---

- Allow ample time to respond or react to improve acceptability and prevent stress
- Timers should count up instead of down
- Provide orientation to time
- Implement time-based triggers to ensure recognition of tasks that should be completed in a recurrent interval

### Positive feedback for correct action completion

---

- Provide failure-free content
- Allow to set goals and receive rewards to increase feelings of success
- Confirm correct steps to complete an action
- Provide brief encouragements during task completion

### Adjustable app settings to personal preferences

---

- Pre-set difficulty levels of functionalities based on educational and cognitive level
- Adjust or customize features to individual's needs and wishes
- Implement functionality adaptations as a series of options to enhance accessibility
- Implement personalized privacy settings

### Attractive and respectful content

---

- Language should be appropriate, taking into account age- and (health) literacy-appropriateness
- Prevent stigmatization
- Use colours in the interface design and graphics to attract interest

# Speech and language

### Understandable words and sentences that feel comfortable

---

- Be explicit and consistent with word choice
- Explain difficult terms and provide a glossary
- Avoid foreign language and technical terms
- Use plain, appropriate language with everyday words
- Use age-appropriate wording

### Options for speech and text input

---

- Adhere to “clear speech” recommendations: *“speak slowly but loudly, insert breaks between phrases and sentences, stress keywords, enunciate each word precisely, and minimize background noise”*
- Implement text-to-speech technology to provide system feedback
- Implement speech recognition and analysis to allow speech input
- Avoid free text inputs when applicable, for example task completion through touch or slide