

Advancing Accessible Interfaces:

Evaluation of Design Patterns and Recommendations for Users with Intellectual Disabilities

Authors

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“ Accessibility means that people can do what they need to do in a similar amount of time and effort as someone that does not have a disability ”

– Alistair Duggin –

The term “accessibility”

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Is designed for all

Many believe that accessibility
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Doesn't imply bad design

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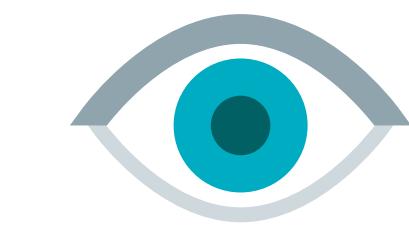


Isn't meant only for digital

Just as this term does not refer to a particular disability, it is also not aimed for digital products.

Disabilities

There are different types of disabilities, but some are more neglected than others.



Visual



Physical



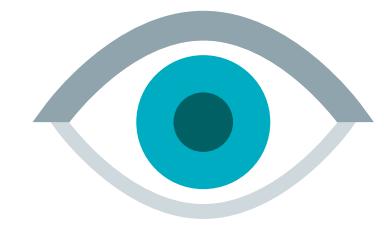
Auditory



Cognitive

Disabilities

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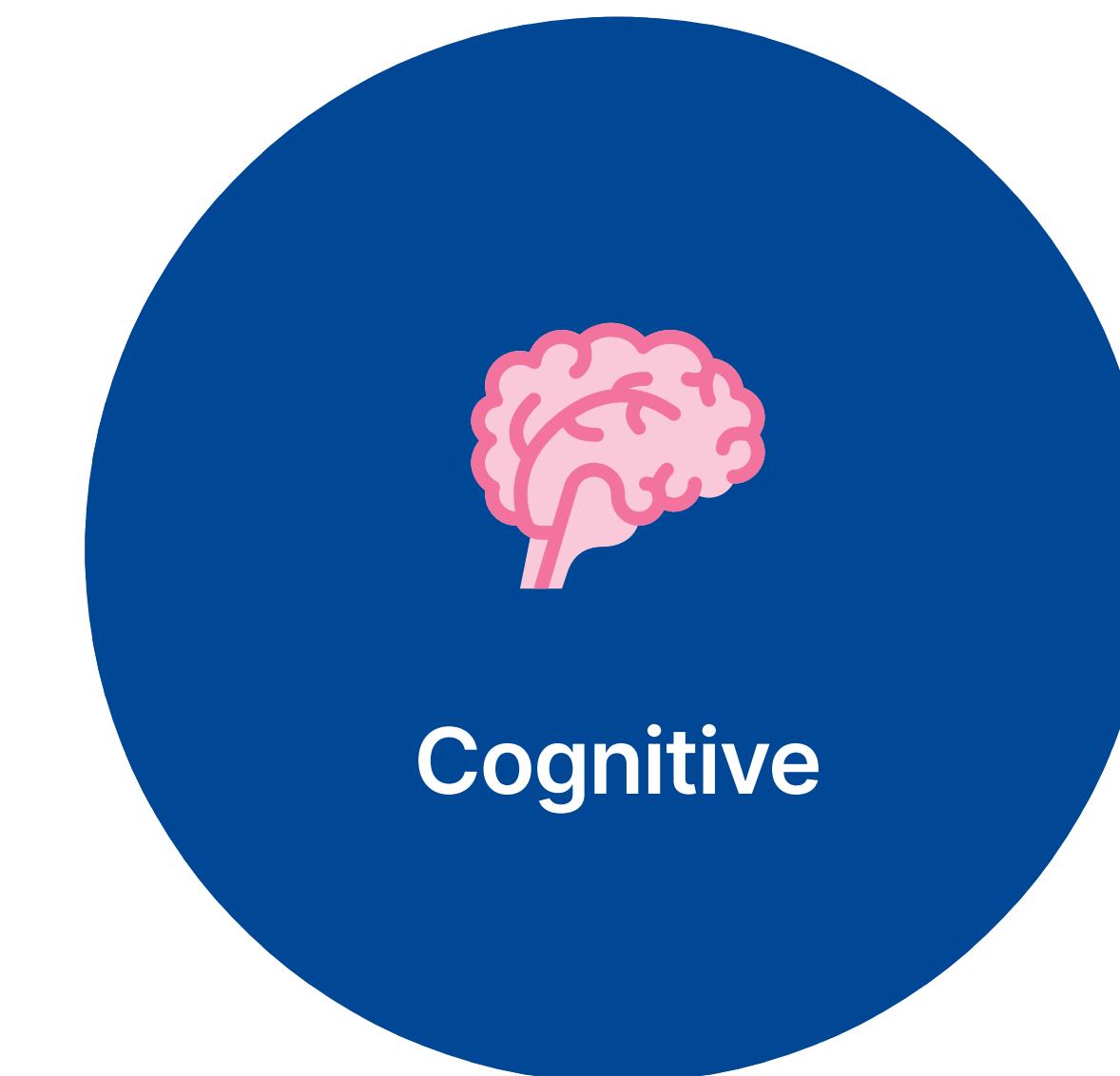
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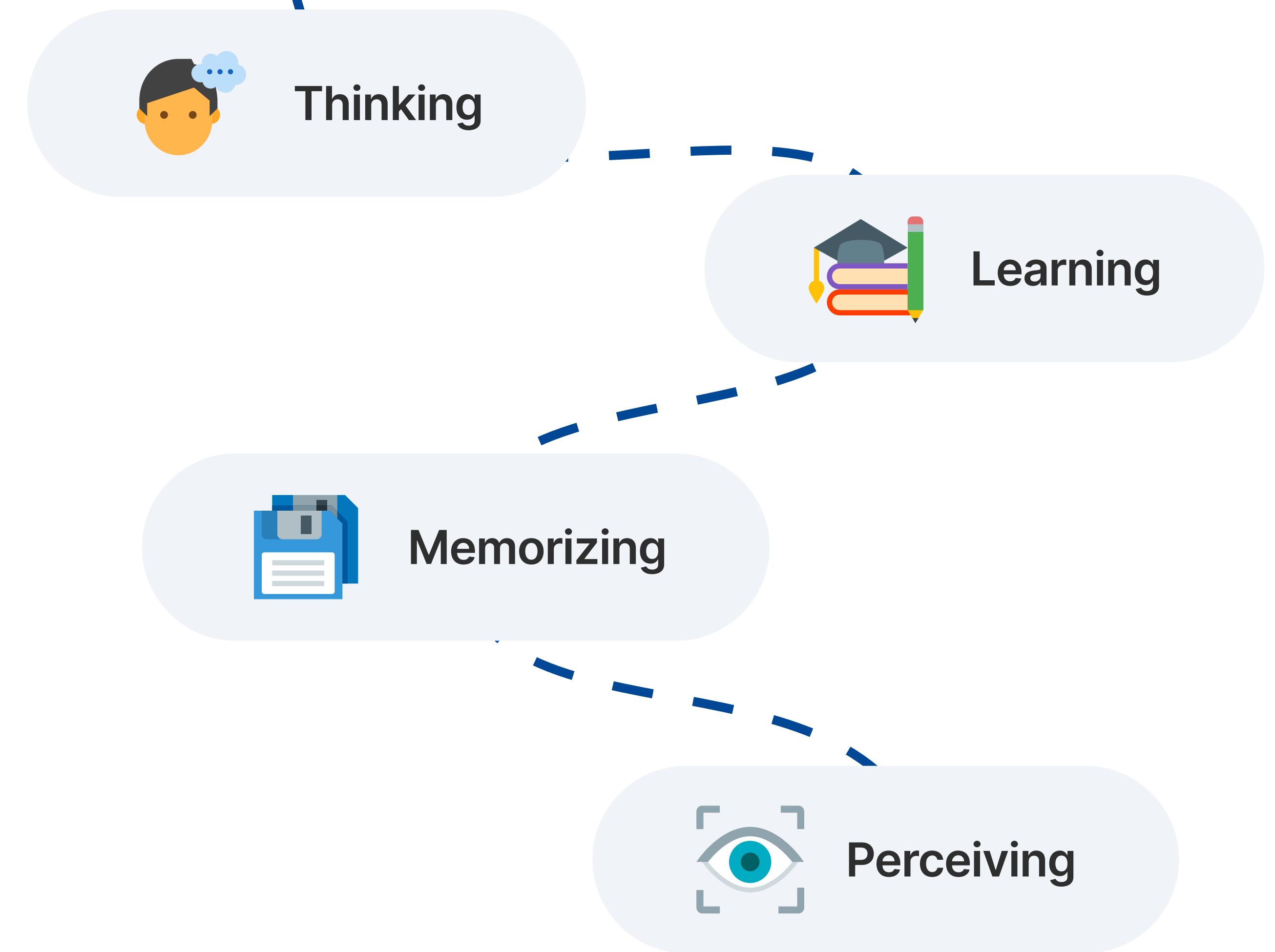
Auditory



Cognitive

Intellectual Disabilities

Affect areas such as thinking, learning, memorizing, and visual perception.



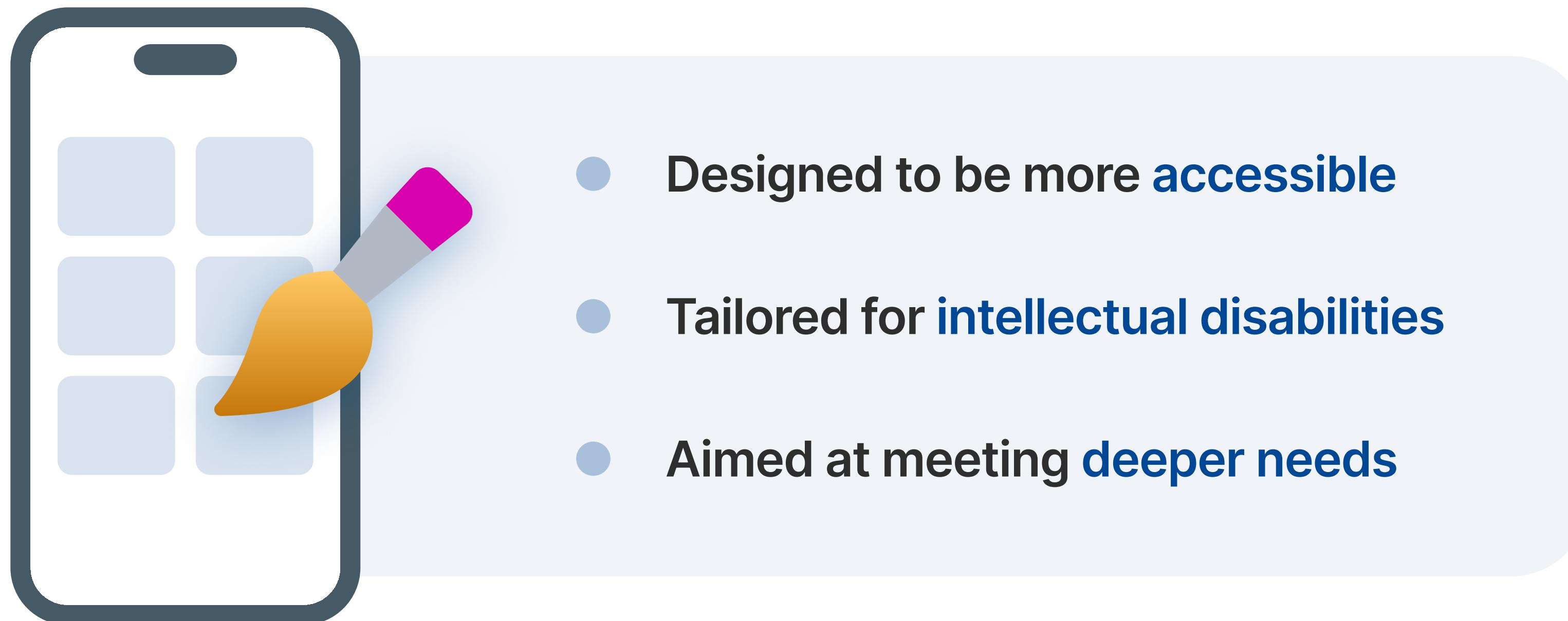


Older people may
experience similar effects
due to cognitive decline.



What this project is about?

Improving the accessibility of an app by redesigning it for people with intellectual disabilities.



- Designed to be more **accessible**
- Tailored for **intellectual disabilities**
- Aimed at meeting **deeper needs**

Process

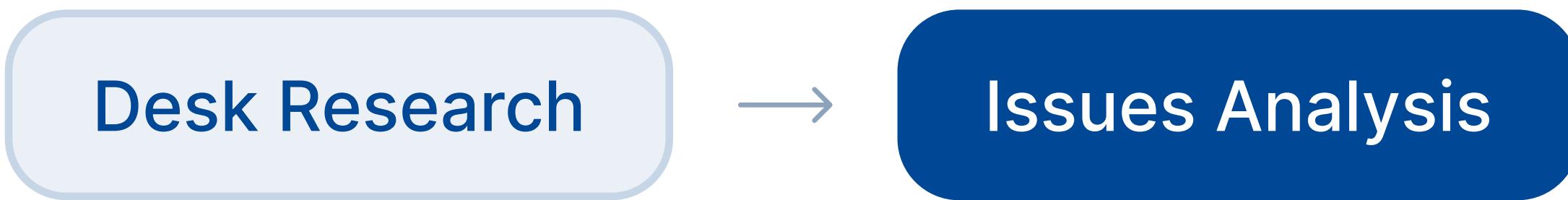
The process involved several stages:
desk research, issues analysis, redesign,
and evaluation.

Desk Research

- Guidelines Analysis
- Accessibility Principles
- Gaps in Research
- Inclusive Museum Apps

Process

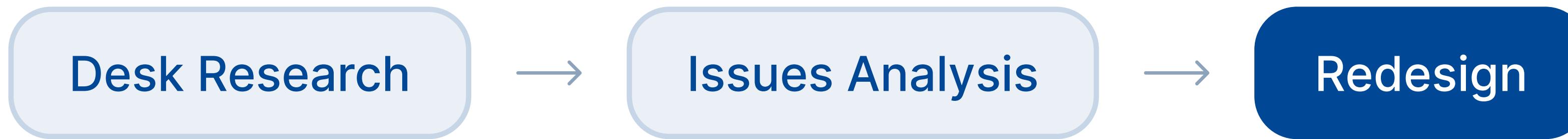
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- Navbar
- Navigation
- Target Size
- Button States

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- Information Architecture
- Color Palette
- Design System
- High-Fidelity Prototype

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and evaluation.



- Exploratory Testing
- Heuristic Evaluation

Desk Research

Guidelines Analysis

Enlarge the **touch area**.

Enhance **contrasts**.

Guidelines success criteria do
not offer **concrete solutions** to
the problems they raise.

Use **Consistent** navigation.

Use simple **gestures**.

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Cognitive Accessibility Principles

Work on **cognitive load**.

Strength the **affordances** of components.

Reduce to 3 the maximum number of **choices** to be made.

Reduce the **abstraction** of metaphors in interfaces.

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Gaps in Research

The **evaluation methods** are not suitable for testing usability of accessible applications.

Basic **design principles** or specific needs are not used.

Very often the **design choices** of the interfaces created are not justified.

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Inclusive Museum Apps

Increase the type of content provided by the app, making it **flexible**.

Make it **customizable** by allowing preference setting.

Emphasize **navigation** by following sequential steps.

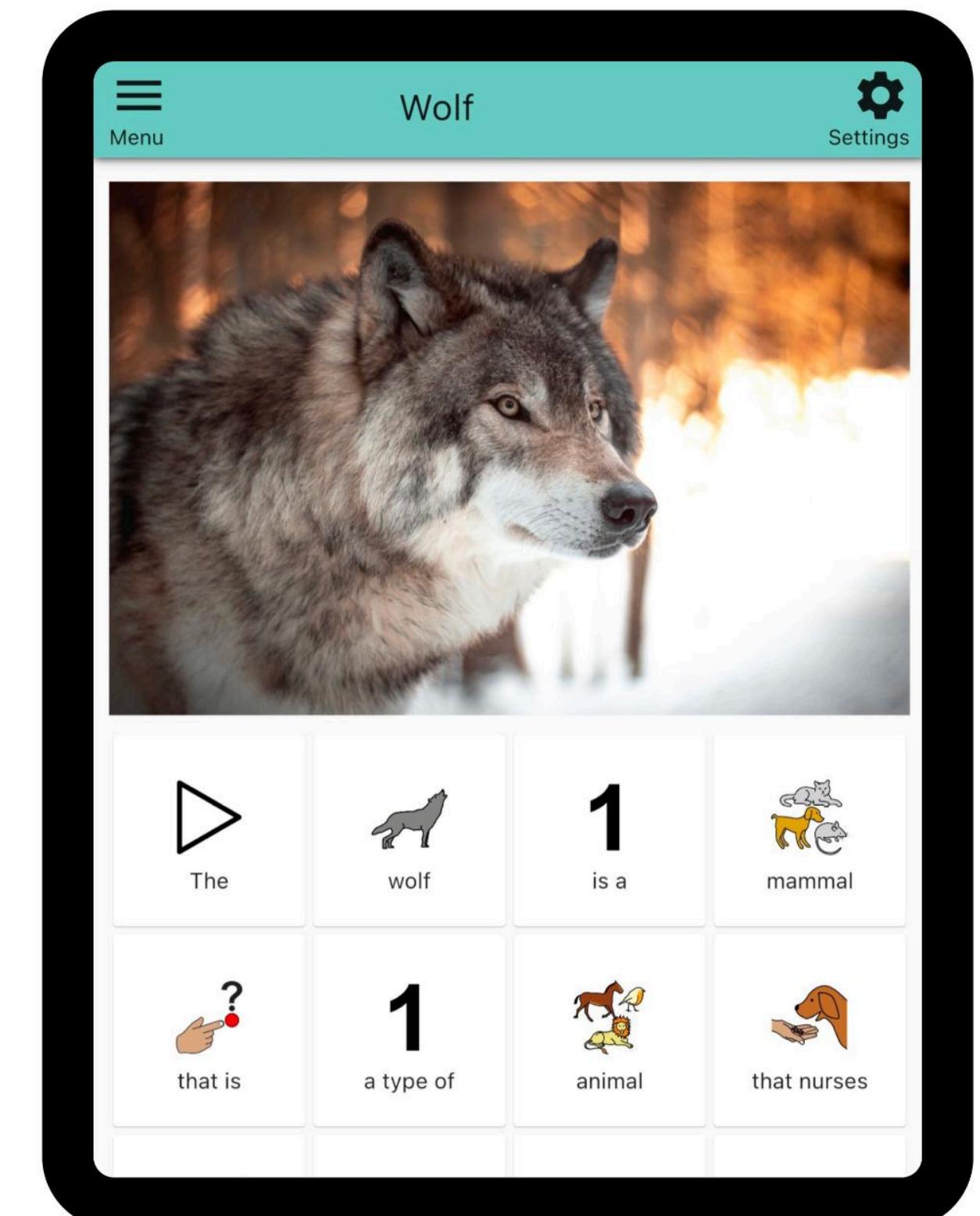
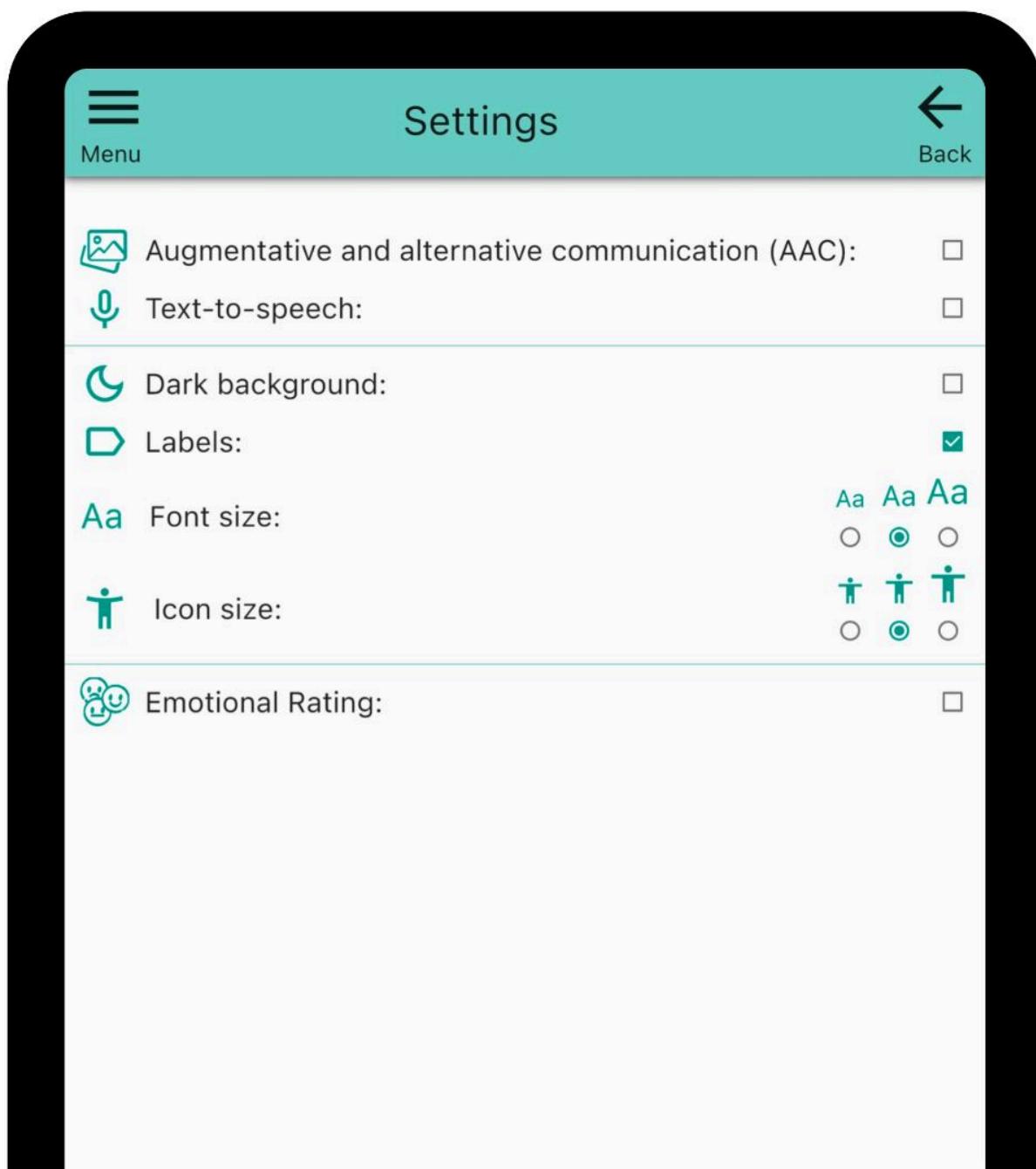
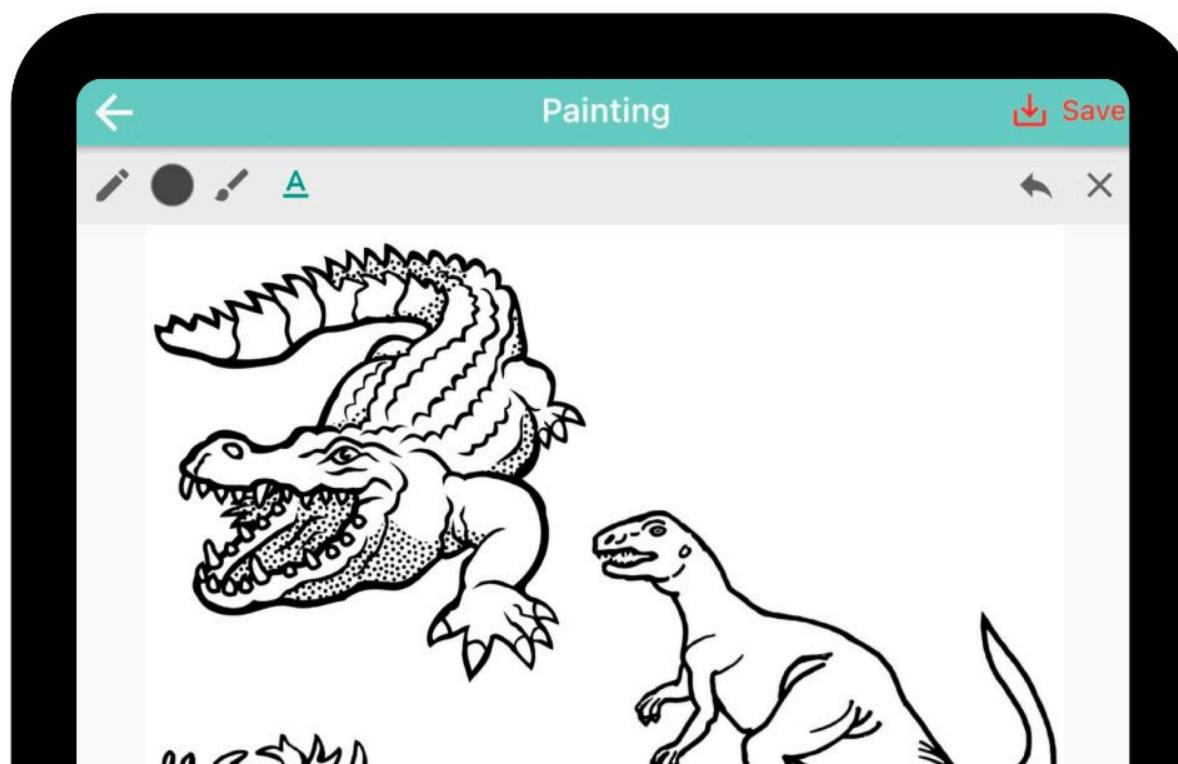
Issues Analysis

Previous Version

1

Navbar

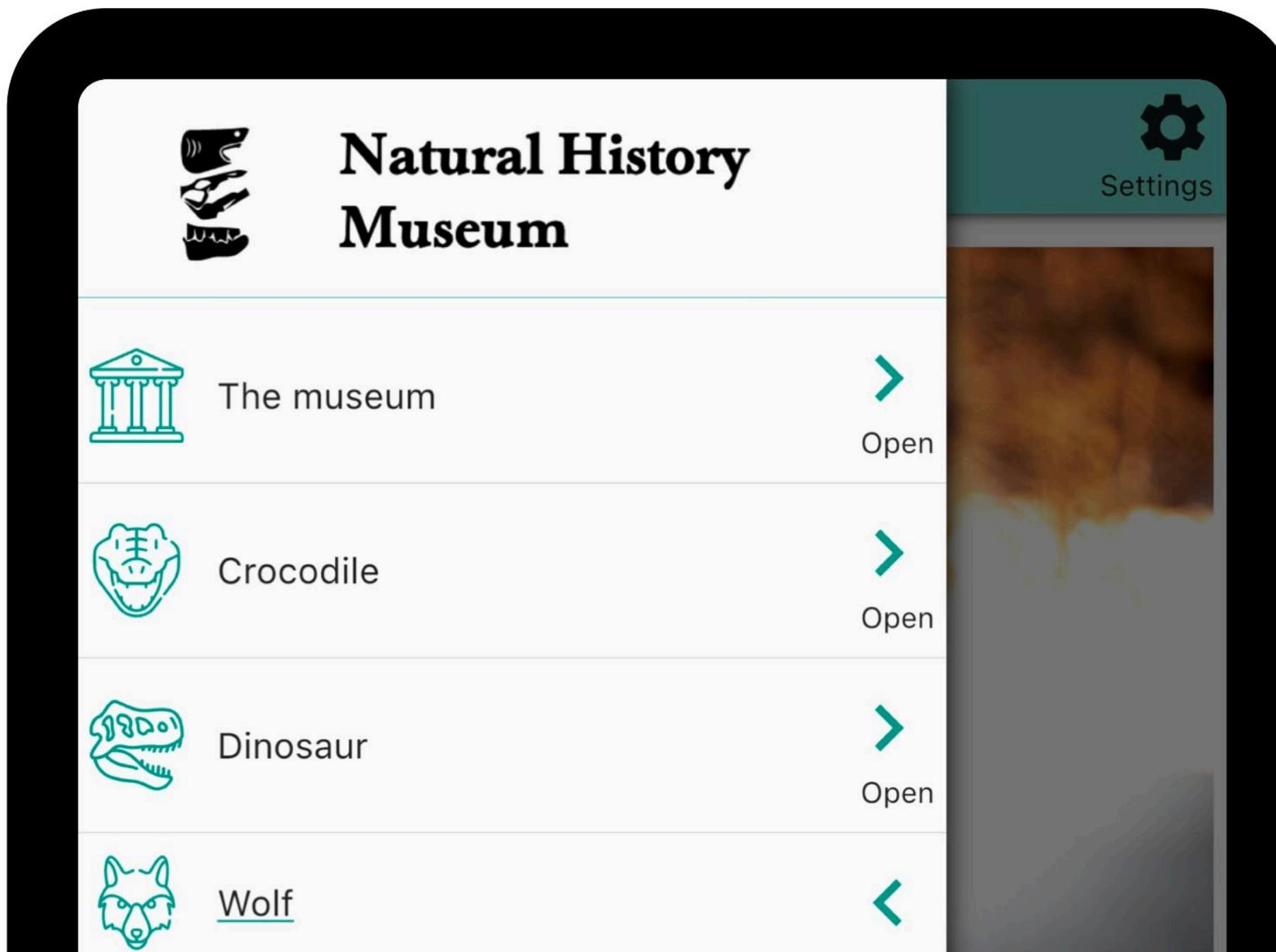
The size, colors and buttons within the navbar change constantly, often there is no 'back' button.



2

Menu-Oriented Navigation

This pattern of navigation is not optimal for people with intellectual disabilities or cognitive decline as stated by the literature.

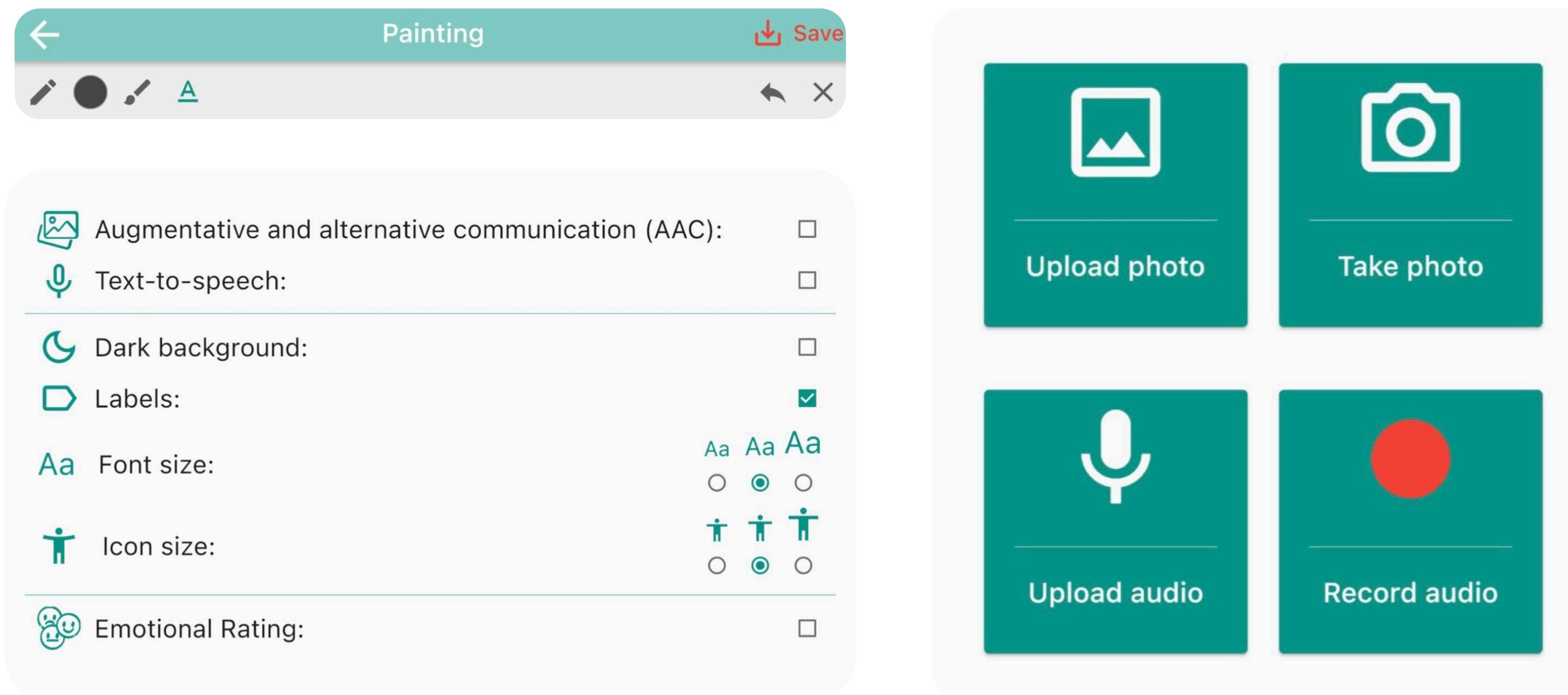


There are **no buttons to close** the sideBar and the **current status** is not immediately clear.

3

Target Size

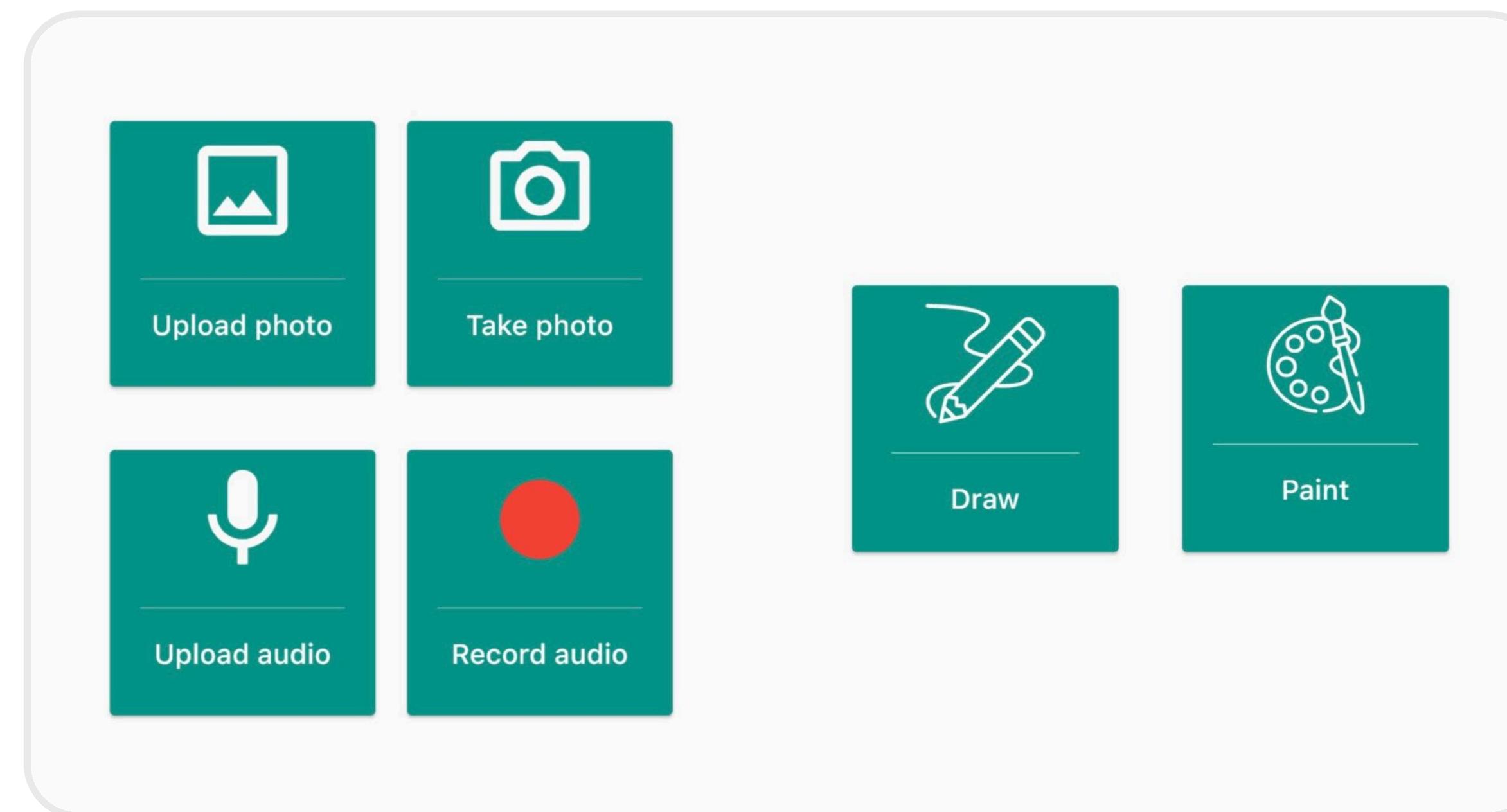
In addition to the inconsistent shape and colors of the buttons, their size is also different.



4

Button States

All block buttons have the same importance, so there is no real CTA, and this increases the cognitive overloading of users.



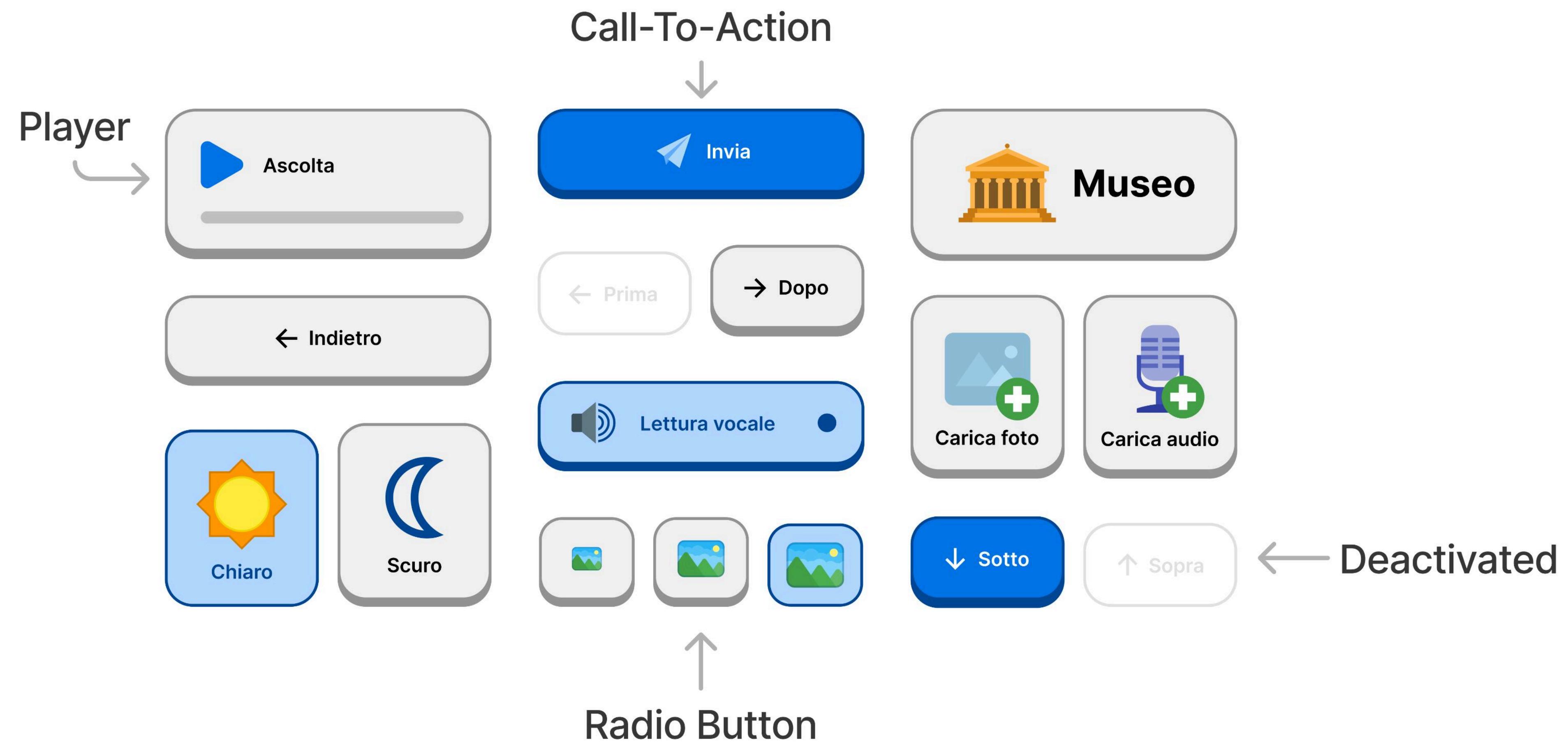
Redesign

Choosing Colors

These colors adhere to the contrast guidelines outlined by the WCAG, while also conveying calmness and confidence.

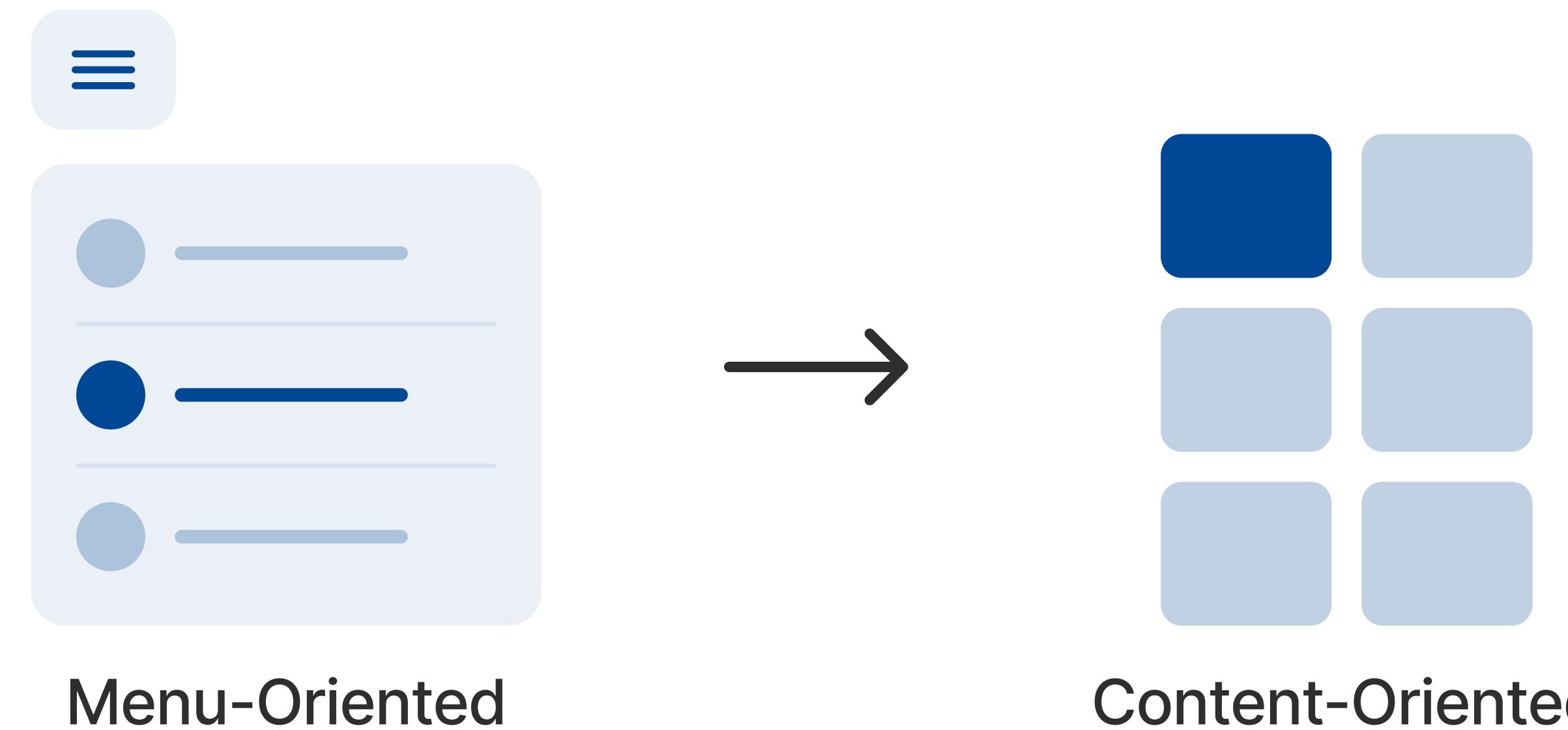
Border AA	Graphical AA	Text AAA	Border AA	Text AA	Text AA
3.03:1	1.43:1	18.42:1	8.99:1	4.57:1	6.01:1

Design System



Navigation

We then changed the information architecture by basing it on content instead of through a menu sidebar.



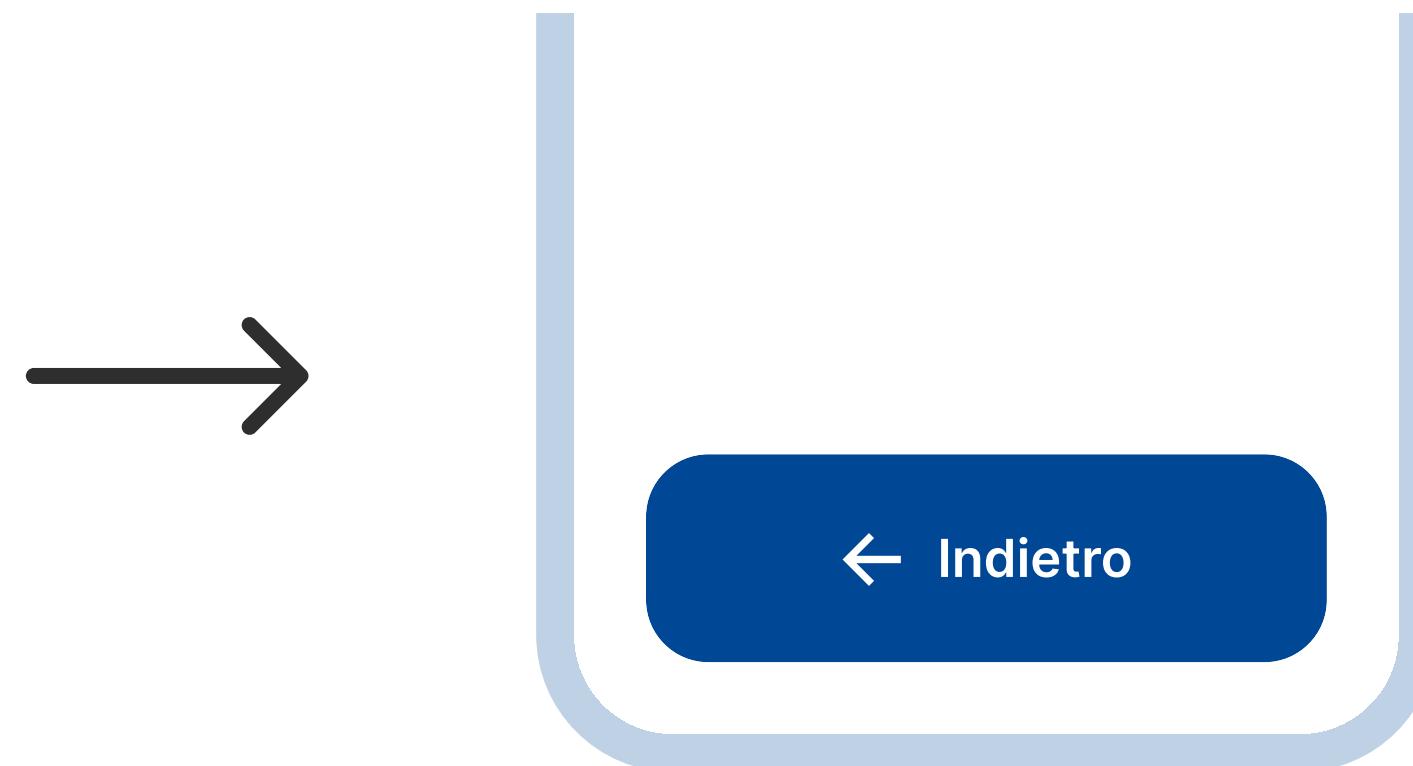
Bottom

Navigation

The navigation now relies on
buttons placed in the footer instead
of on hamburger icons.

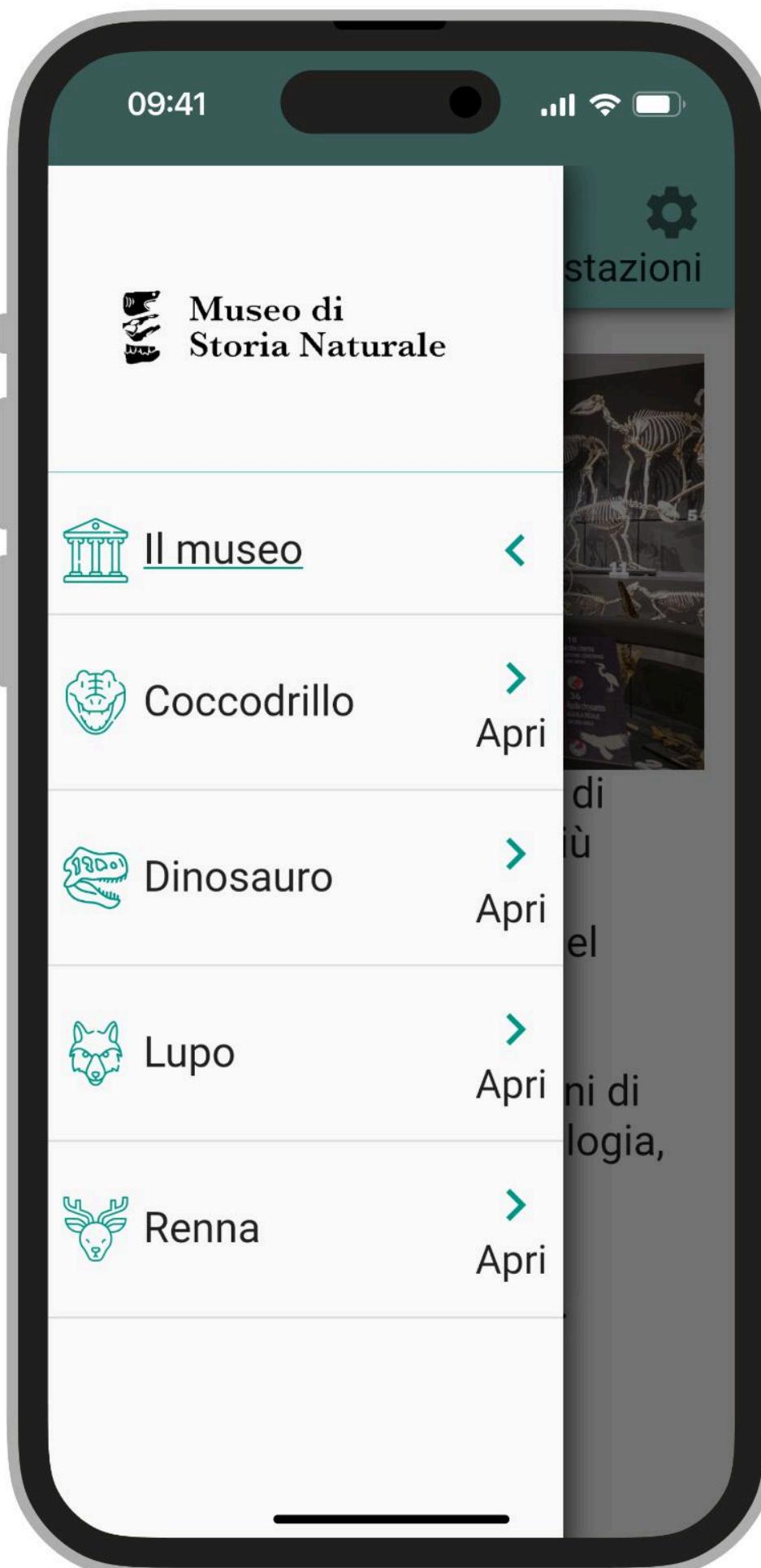


Top Navigation

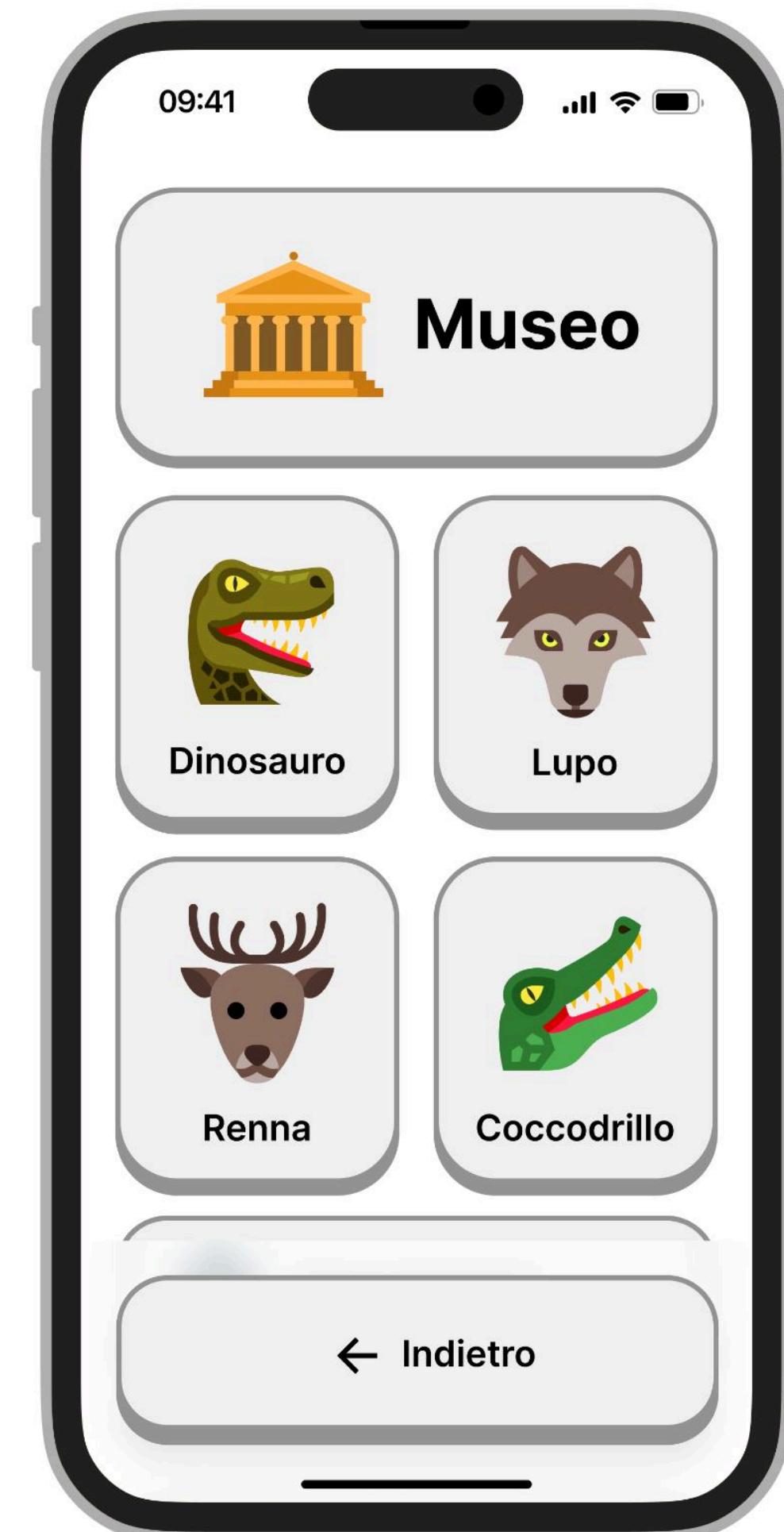


Bottom Navigation

Before



After

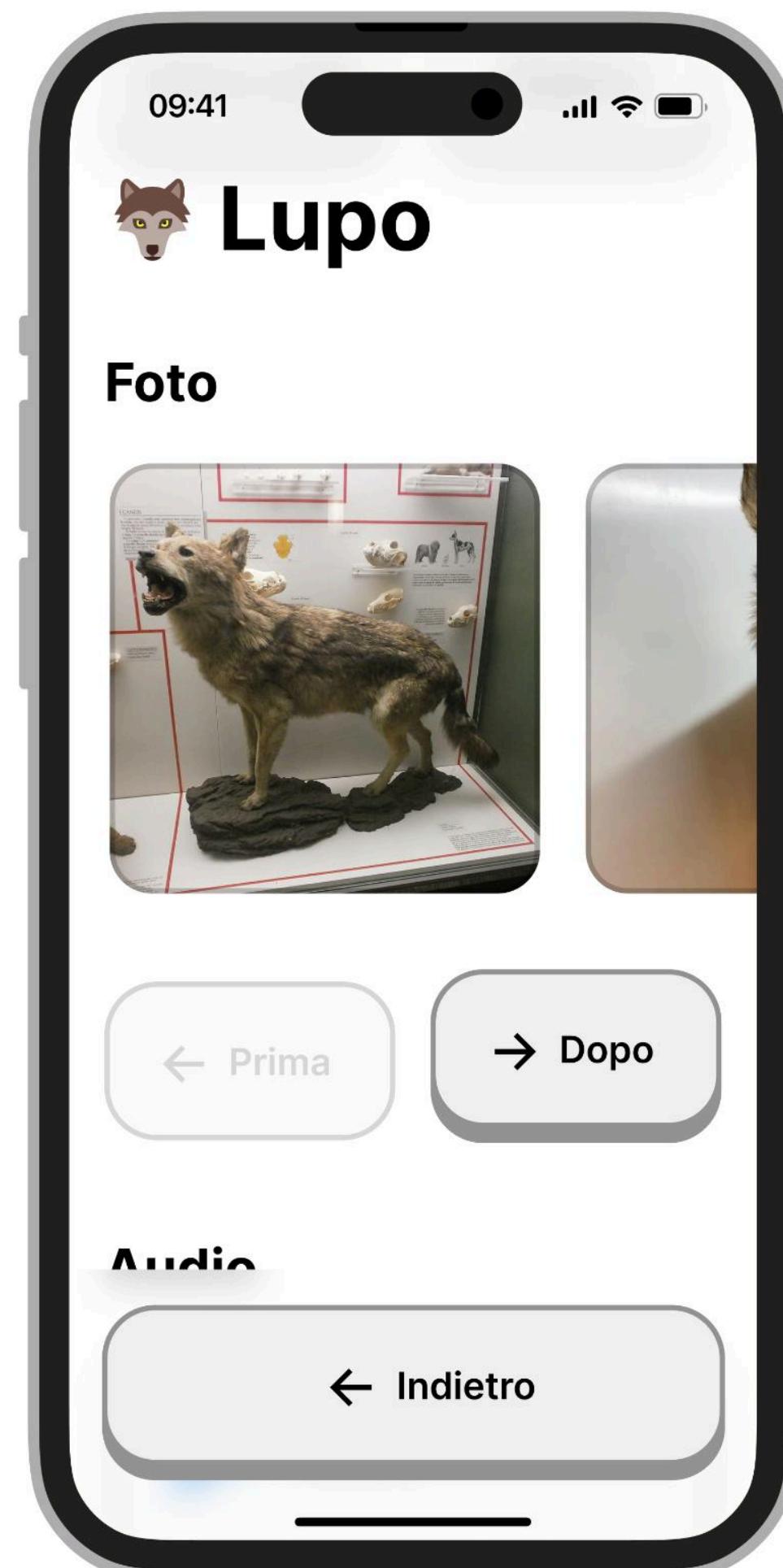


Auto-Scrolling

This feature helps users scroll through content, simplifying this complex gesture with automatic scrolling buttons.



Horizontal



Vertical



Onboarding Screens

Set of screens to help users choose the right settings based on their preferences with the use of progressive disclosure.



Text & Icon Size

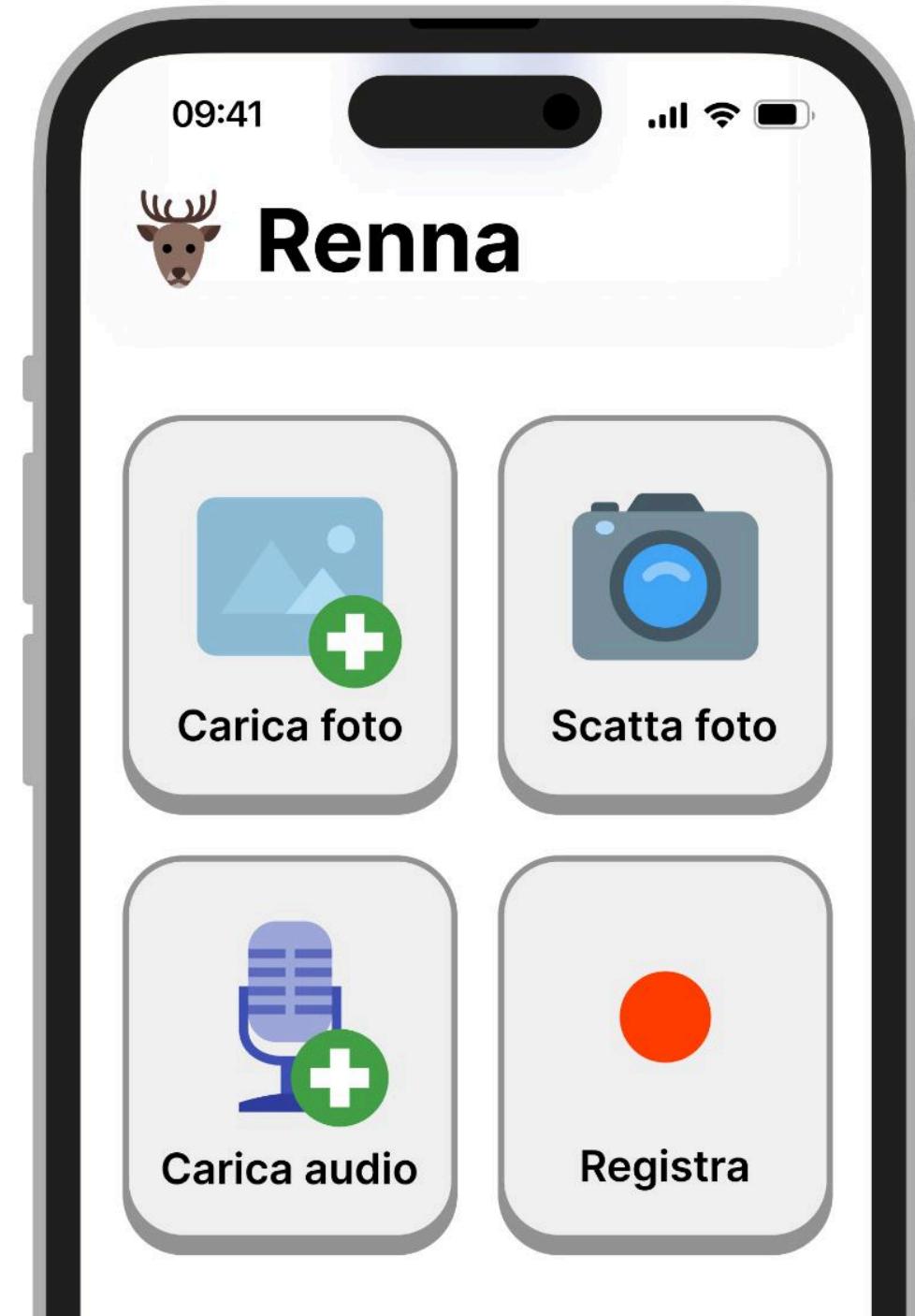
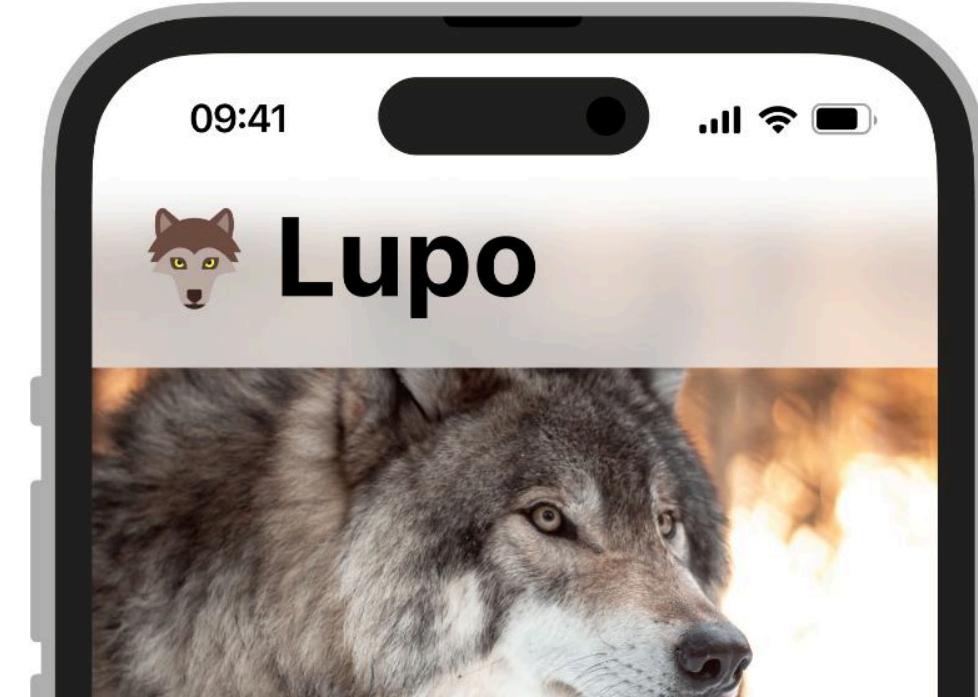
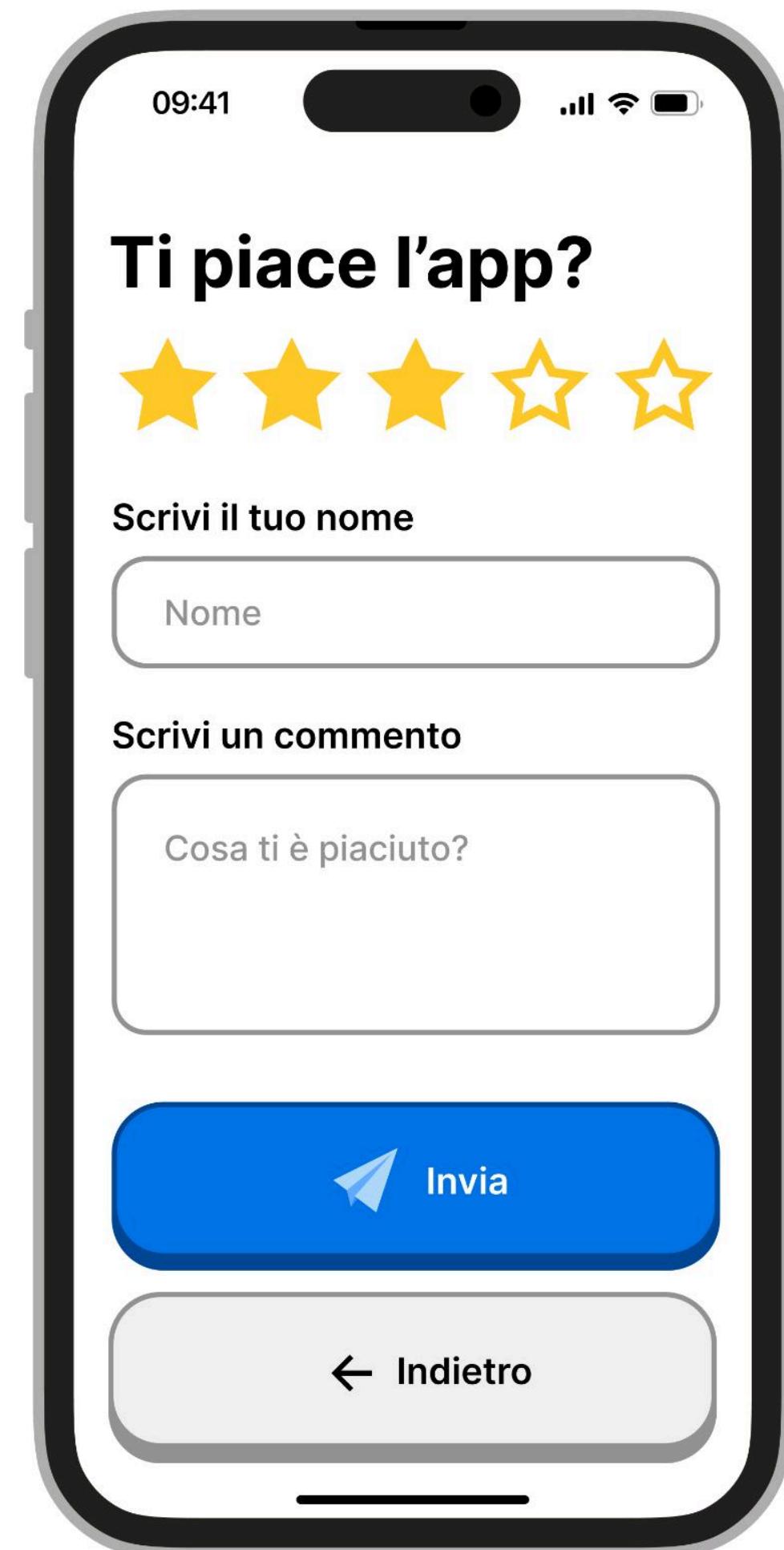
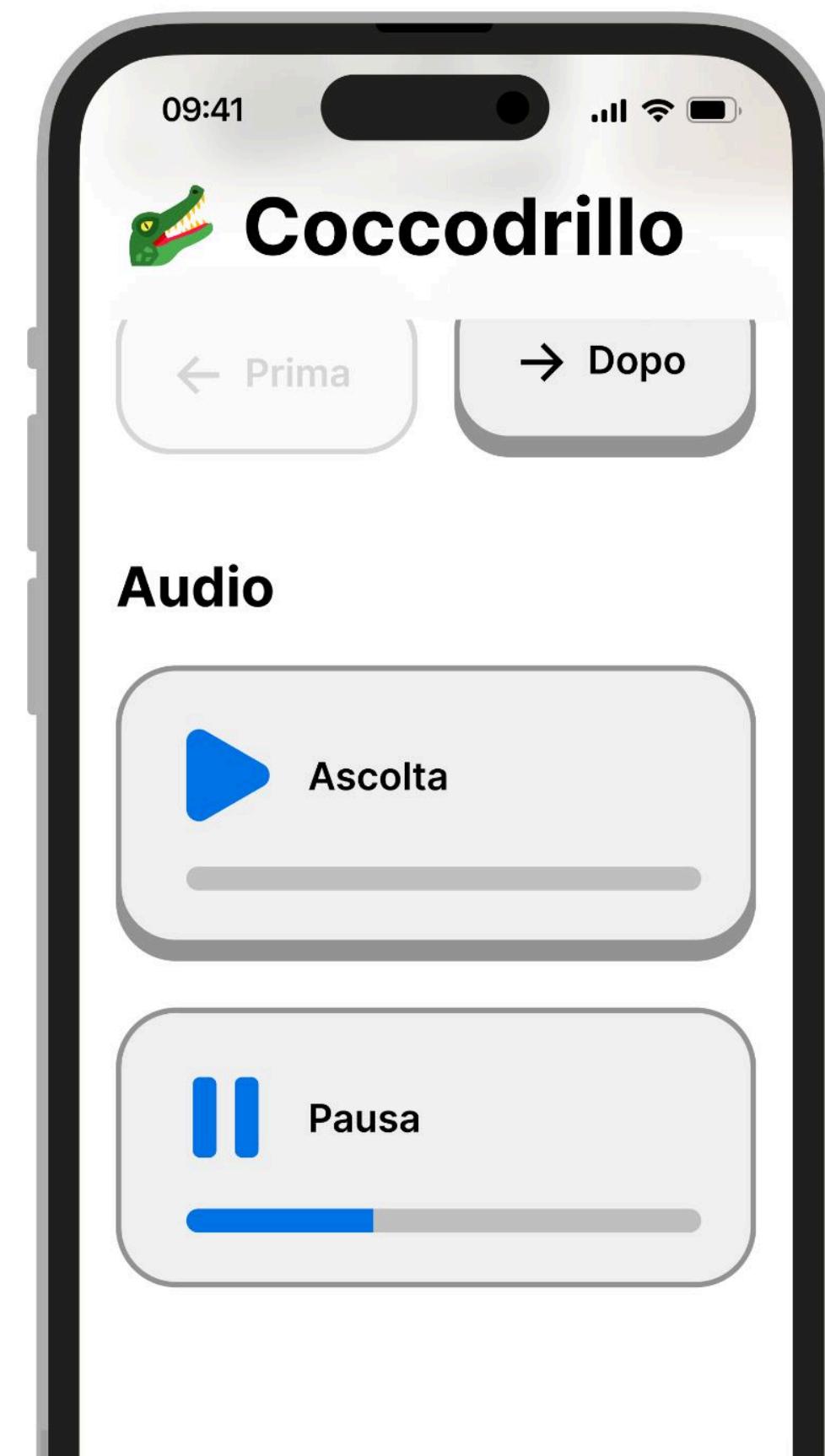
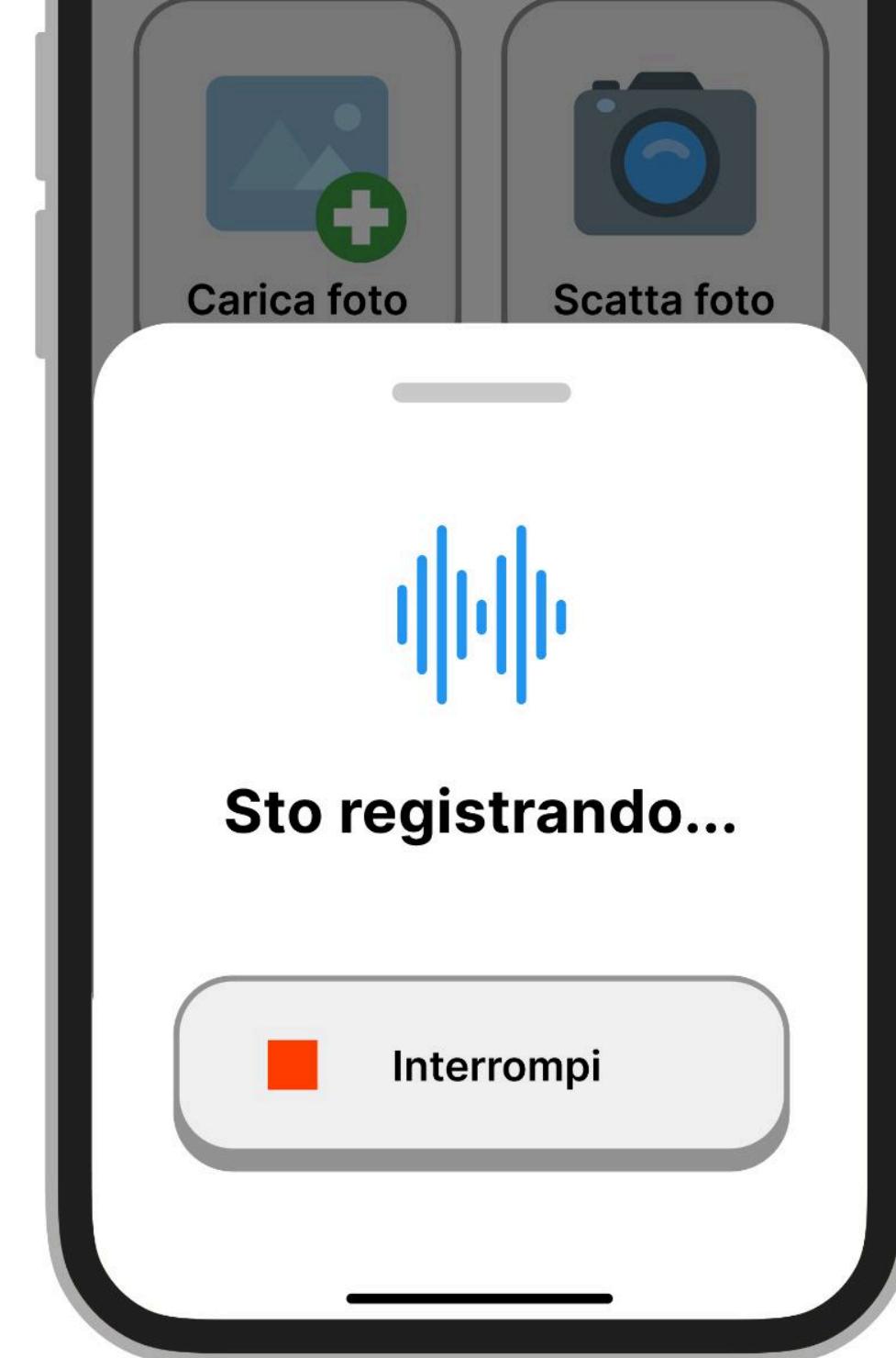


Features



Color Theme

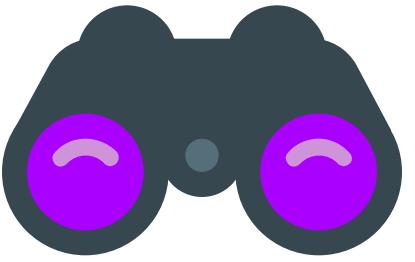




Evaluation

Exploratory Usability Testing

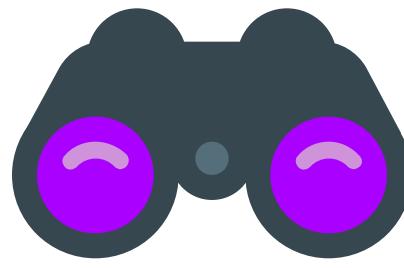
Exploratory Usability Testing



Usability Exploration

This usability testing method was aimed to observe the usability of the app using unstructured tasks.

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Qualitative Approach

We opted for qualitative rather than quantitative approach given the low number of participants.

Exploratory Usability Testing



Pros

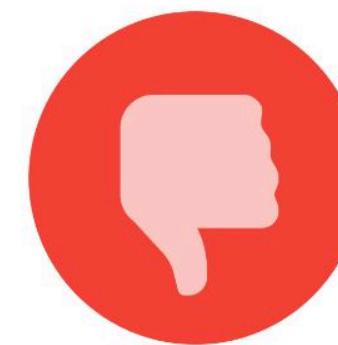
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- ✓ Button appearance
- ✓ Content-oriented navigation

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Cons

- ✗ Auto-scrolling didn't help much
- ✗ Onboarding need clear examples

Heuristic Evaluation



Inspection Method

It is a usability inspection method where experts assess an interface to identify usability issues.

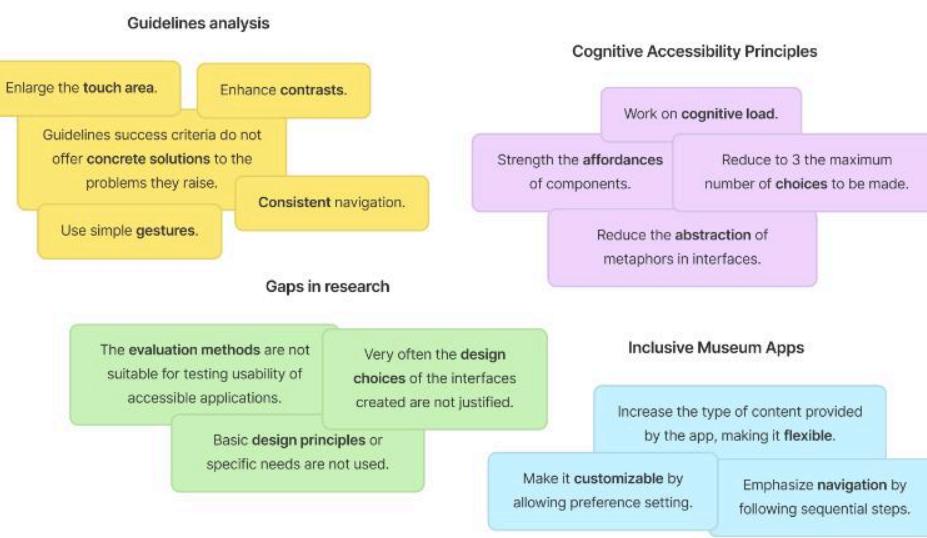
Heuristic Evaluation



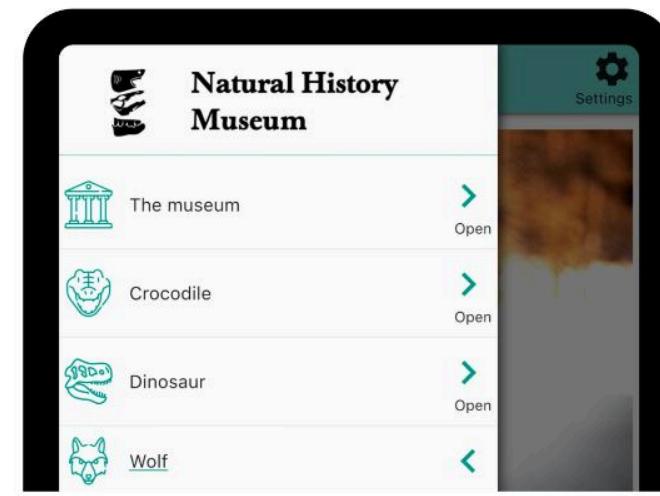
Educators' Recommendations

- Avoid **forms** as inputs
- Don't **deactivate** buttons
- Avoid **question marks**
- Always use **labels**
- Don't use too much **onboarding screens**
- Keep in mind **plain language** and **AAC**

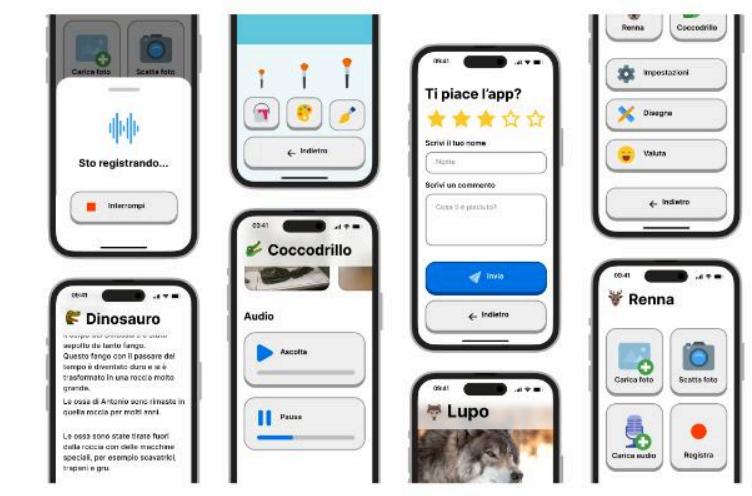
Let's wrap up



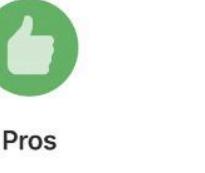
Desk Research



Issues Analysis



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Thanks for the attention



Question to andrea.esposito@usi.ch