IHM – Report

Matthieu Burguburu Alexandre Piveteau

11 November 2020

1 Introduction

The goal of this report is to present the app we developed during the Human-Machine-Interfaces course at HEIG-VD by listing its functionalities, justifying the different design choices we took and showing a few screenshots to give a feel of the app or serve as a makeshift tutorial to use it efficiently.

2 Functionalities

- Basic functionalities
  - Creating stickies
  - Editing stickies
  - Deleting stickies
  - Undo deleting of a sticky
- Categories
  - Categorizing stickies
  - Swapping two categories
  - Moving a sticky from one category to another
  - Reordering stickies in a category
  - Customizing a category name
  - Customizing a category icon
- Reminders
  - Choosing the reminder's day
  - Choosing the reminder's hour and minute
  - Visual indication showing a sticky needs attention
  - Textual indication showing the reminder date and time
- Multi-touch
  - Can drag and drop multiple stickies at a time
  - Can drag a sticky, open or close a category, and drop it in the new context

3 Thoughtful design

We designed our application by following the principles of design as described by Don Norman, and, most importantly, common sense. Whenever we thought of a functionality, a button, a method of control or access to something, we also took into account whether or not elderly people could use the app with as much ease as possible. We tried to find a good balance between usability by older and younger people alike, to not isolate our app from a part of the population. Two of the aspects we focused our attention on were discoverability of possible actions and understanding of how to perform them, as well as what they do.
Below you will find a list recounting the principles of design as told by Don Norman which greatly help usability of a product concerning these two aspects when applied properly. Each of these principles will be followed by a short analysis of its place in the design of our application.

- **Affordances:** *are there buttons, switches, knobs, etc to make the actions possible ?*
  To reduce the amount of visual clutter on screen, we tried to limit the number of buttons and switches and instead opted for as much "natural" hand gestures as possibles. Whenever a hand gesture was not appropriate for an action, we added a button to make the action possible, as well as signifying it.

- **Signifiers:** *are there means to support the access to the available actions ?*
  As stated previously, every clickable button or element has its functionality signified, whether with a piece of text, an icon or both at the same time. For primary actions, such as saving and updating stickies, we paid attention to combine both an icon and a text signifier, to clearly emphasise what the action is about. For rare actions that could not be explicitly signified, a help section can be accessed to gain insight over the way to perform them.

- **Mapping:** *what is the relationship between controls and actions ?*
  Real-world stickies are, by nature, extremely flexible. They can be moved around, re-ordered, stacked on top of each other, and do even come in multiple colors. We tried to replicate this mental model by providing a clear mapping between what the user sees and does on the touch screen, and what's actually happening to their data.
  In our app, stickies can be dragged across different stacks, and re-ordered within the stacks. Dropped stickies are inserted at the position at which the user drops them, and stickies can be freely moved between stacks. The spatial mapping between where stickies are on the screen and where they will be dropped is therefore extremely clear – a sticky will always be dropped right where the user decided to drop it.

- **Constraints:** *are there guidelines for action ?*
  To prevent the users from losing themselves in a sea of disorganized stickies, we decided to prevent the freeform reordering of stickies and opted for a categorized way of organizing stickies. These categories are customizable (to a certain extend), as the user can reorder them around, change their title as well as choose an icon for them from a select pool of icons. Other constrained actions present in the app can be found when creating or editing a sticky. The day and time of the reminder, as well as the color of the sticky are all constrained choices. This prevents the user from wondering what the limits of these actions are, and guides them quickly to the appropriate way to perform them.

- **Feedback:** *is there continuous information about the results of the actions, the state of the device ? is it possible to infer the new state ?*
  We use visual and haptic feedback in many situations to signify the user that his action is being registered, as well as tell him how his action is going to affect the state of the application. For example, when beginning to drag and drop a sticky, a vibration can be felt in the tablet. Also, the sticky being dragged and dropped follows the user's finger to visually show him where it will be dropped when he releases it. Another example would be the clock showing the selected time for a reminder in an analog manner, which might

be more familiar for older people and more easily seen, as the user's finger obstructs the number wheels.

- **Conceptual model** *is there a model that eases the understanding of the interface ? that provides the feeling of control ?*
  To help visualize the state and control over the interface of the Stickies app, we decided to model it as close as possible to the real world version of a post-it board. Thus, every sticky or sticky pile can be manipulated using hand gestures. Also, when opening a category, the stickies from the home page move out of view instead of disappearing, while the stickies of the selected category spread out on the new page view. This lets the user have a clear mental representation of which state the application is currently in. We also opted for not using any menus, drop downs or the like to simplify the conceptual model.
  On top of that, stickies are continuously animated between the home and category detail destinations. This way, the user remains in context all the time, and shared content across the screens stays visible, reducing the mental strain of navigating in a content hierarchy.

3.1 Designing for error

As we were crafting our user experience and design, we accounted for two main types of errors : mistakes and slips. Mistakes occur when the user does not fully understand the action they're performing, and slips when they perform an action they didn't intend to perform originally (for instance by pressing the wrong button, or thinking they're in a certain mode rather than another). We decided to approach these two kinds of errors differently.

- We tried to reduce **mistakes** by clarifying what the effects of our call to actions will be. By making use of exhaustive signifiers and a mental model that maps the "physical handling" of stickies, our prototype tries to minimize the risk of misunderstanding what's going on. On top of that, we also display some extra labels in the category details screens, clearly stating how to manage stickies, move them to other categories or delete them.
- We tried to reduce **mode-error slips** between the home and category details screens by making actions and interactions similar between the screens when they have similar effects. Long pressing a sticky will always result in the sticky being lifted and following the finger; dropping a sticky will always put it at its drop target (even if this sticky came from another category, it will be released right where it's dropped, in a different category !); and clicking a sticky or a pile will always "expand" its content.
  When a sticky is deleted, we also paid extra care to displaying a non-intrusive undo call to action, which contextually appears for 5 seconds as the item is deleted. We decided to add an undo for this action because it has **consequences**, it's **not easily recoverable** and it's **easy to do**. On the other hand, we considered that actions that tend to require more effort (such as editing a sticky title) do *not* require undo actions, since they're highly unlikely to be slips or mistakes.

4 Screenshots

In this section, you can find a few screenshots taken from our app on an android tablet. These screenshots are not modified in any way and can be replicated easily if using a multi-touch enabled tablet. On some of the screenshots, the position of the user's fingers is represented by a small grey dot.

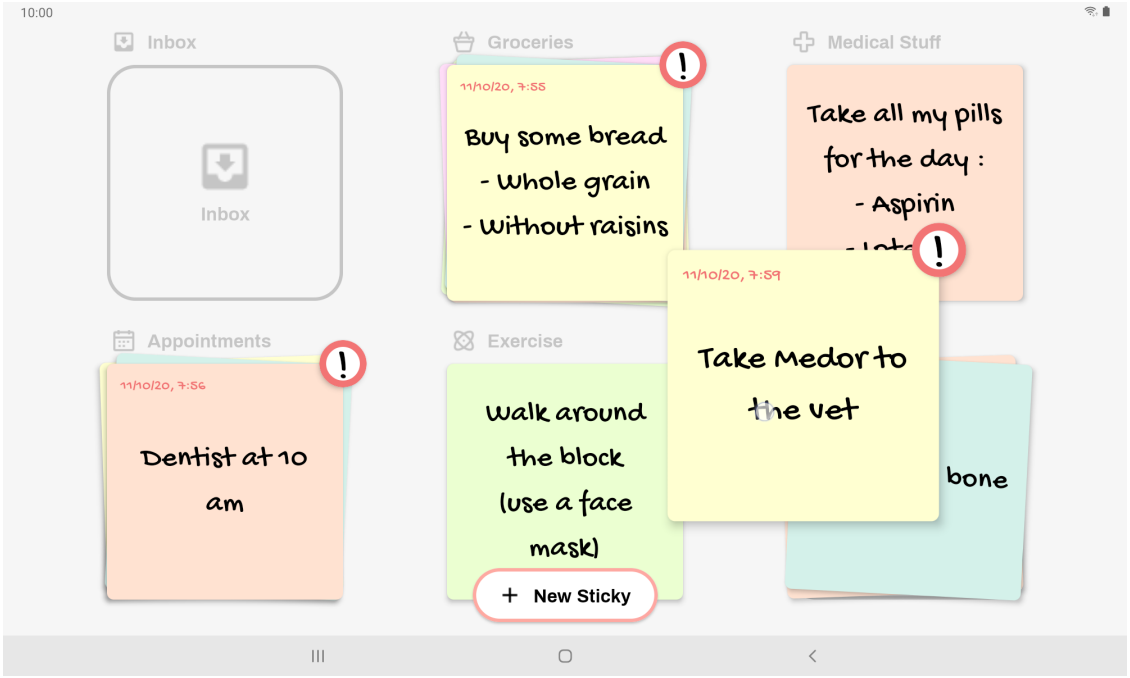

Figure 1: On the home page, long pressing a sticky will lift it up and allow it to move it to another category.

Figure 2: If using a multi-touch enabled tablet, multiple stickies can be dragged at the same time, and it's quite fun to do !

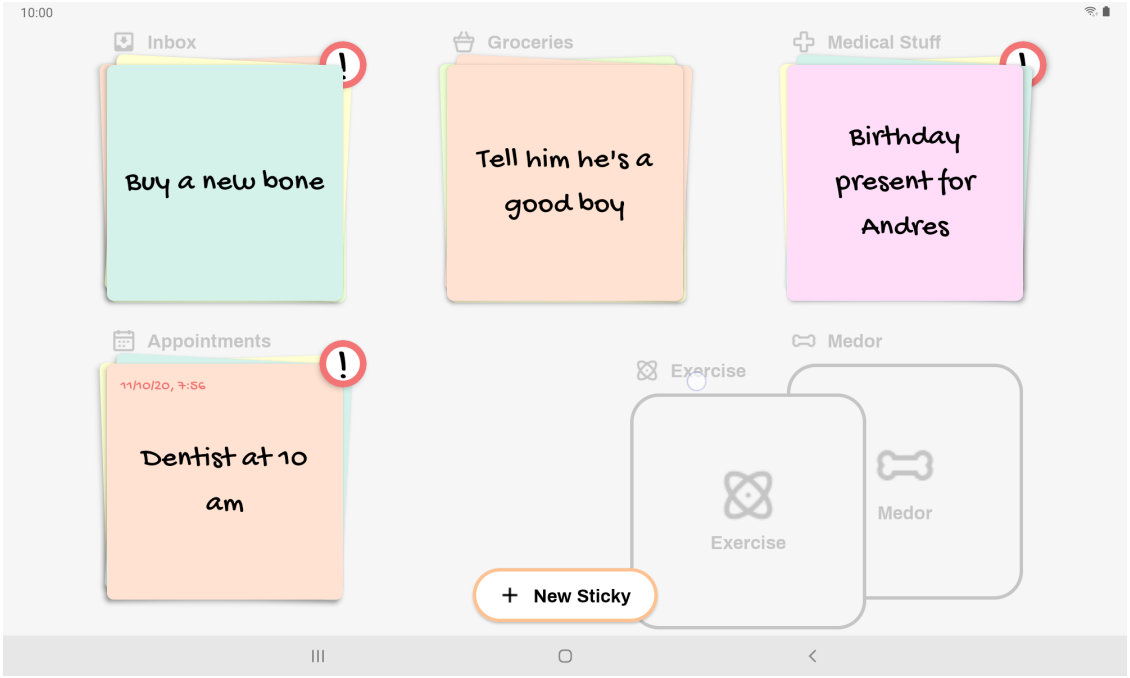

Figure 3: On the home page, a category (and its content) can be dragged and swapped with another one by long pressing its title and moving it over the other category.

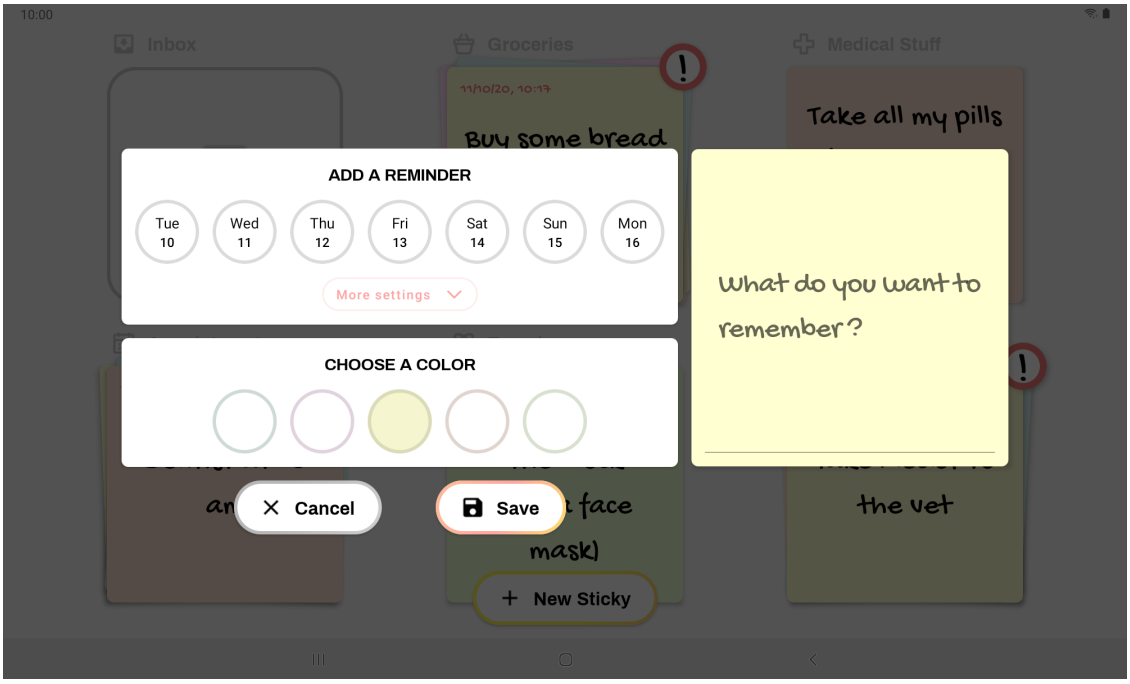

Figure 4: When creating a new sticky, no reminder day or time is selected and a slightly greyed out text indicates to the user that they can add text to the sticky.

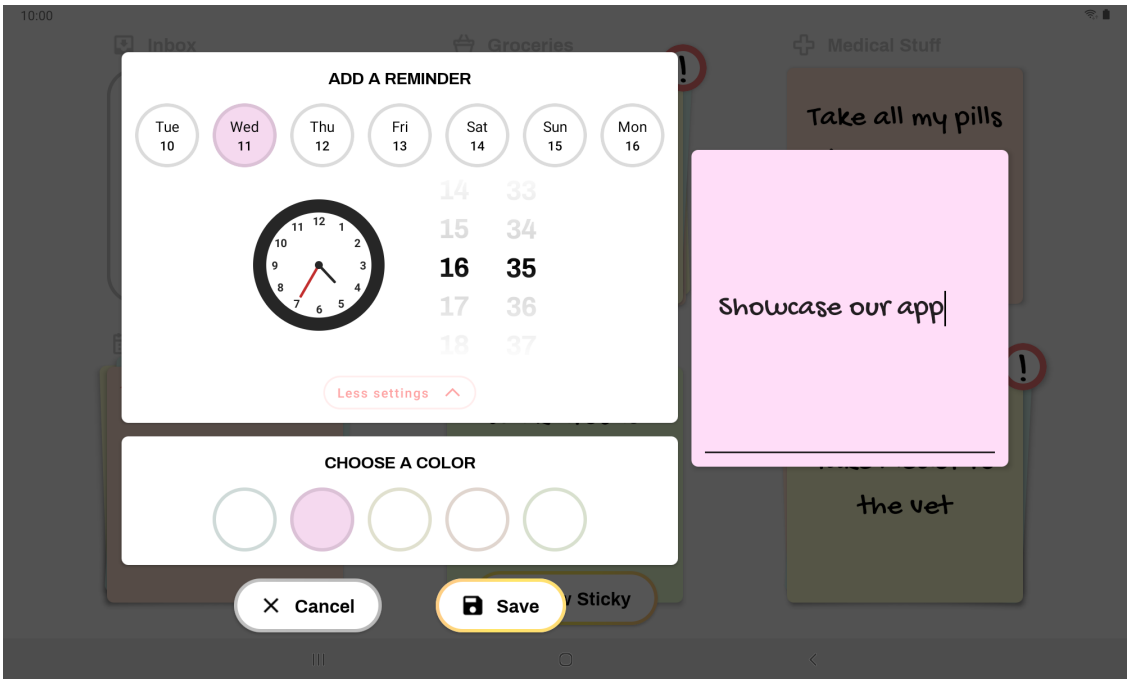

Figure 5: Clicking on the "More settings" button will expand the sticky details and reveal a widget to choose the time of the reminder, consisting of two scrollers to change the time as well as a clock to display the selected time.

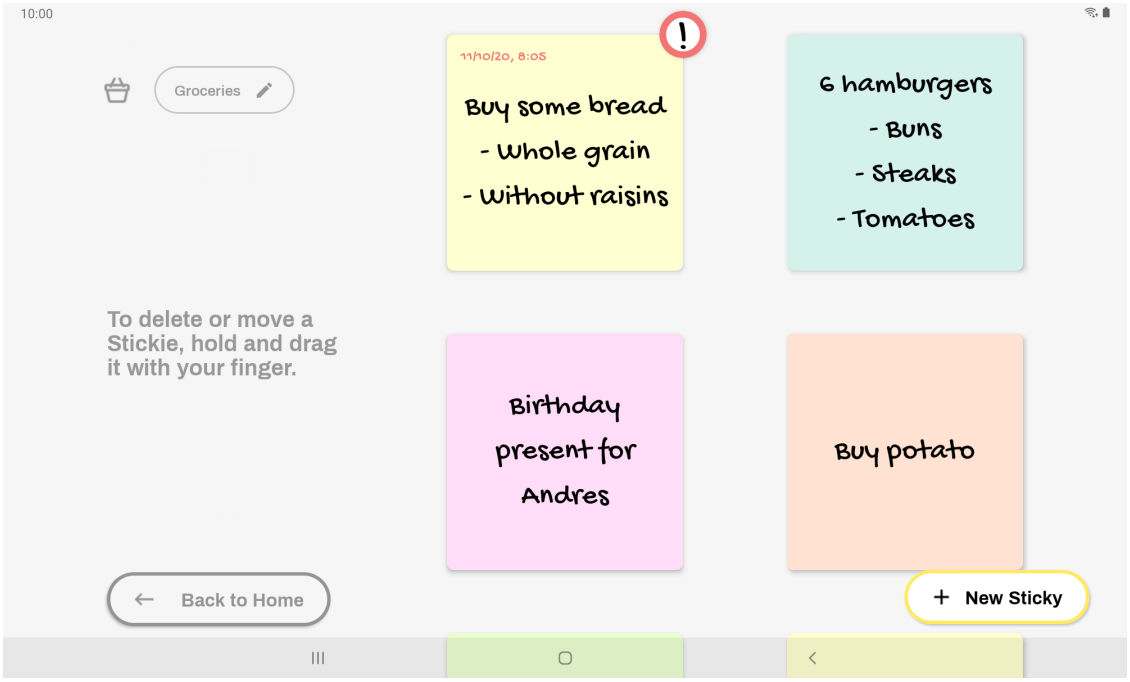

Figure 6: When too many stickies are present in a category, the user can scroll down to reveal them. The top of the hidden stickies peeks out of the bottom of the screen to show the user they exist.

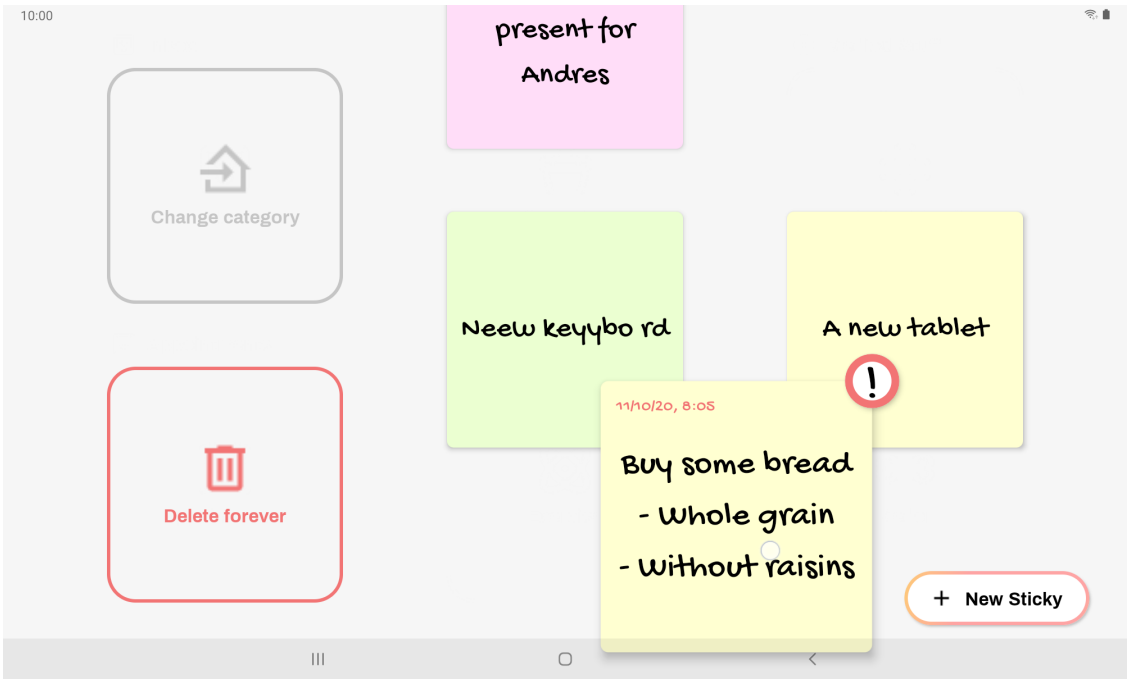

Figure 7: While in a category, stickies can be dragged over one another to reorder them in the column.

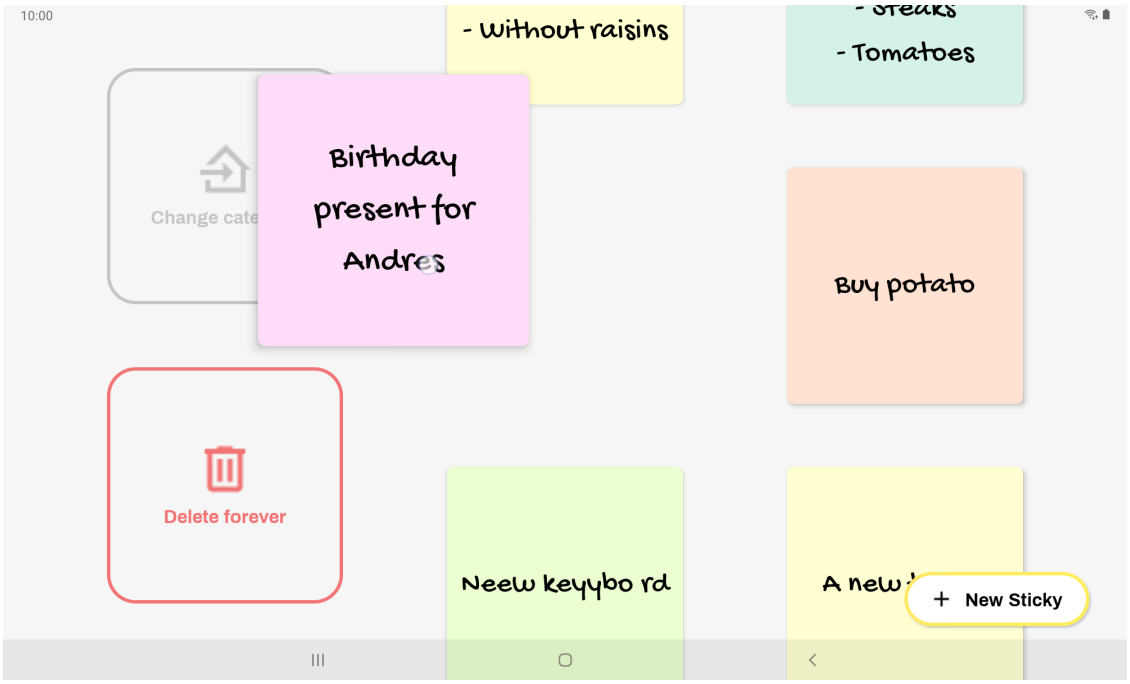

Figure 8: While in a category, stickies can be dragged over the two available actions on the left side of the screen to either change it's category or delete it forever.

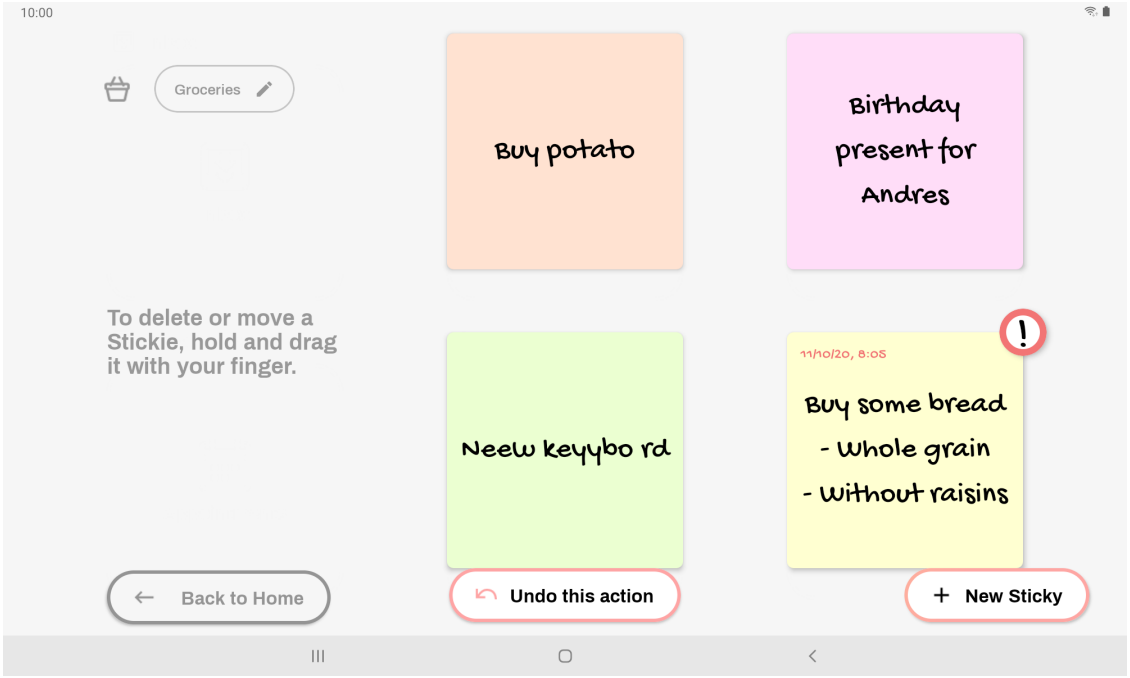

Figure 9: After deleting a sticky from a category, an undo button pops up on the screen for a few seconds, in case the action was not intentional

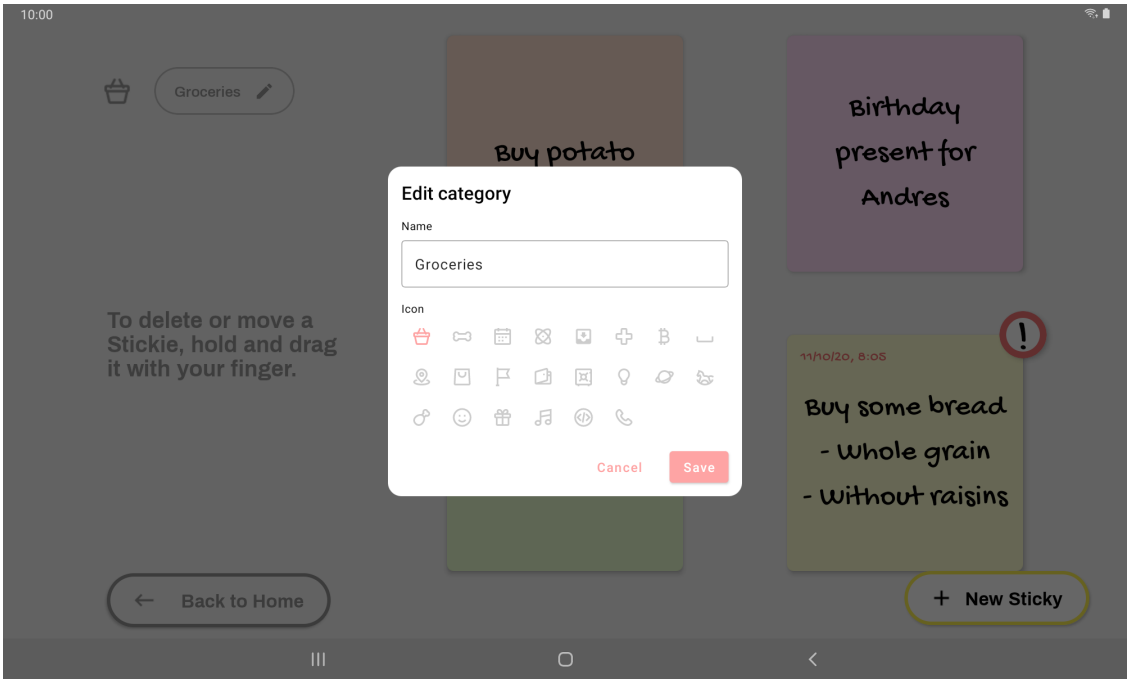

Figure 10: While in a category, clicking on its name or its icon on the left side of the screen will open an overlay, letting the user customize the name and icon if the category.

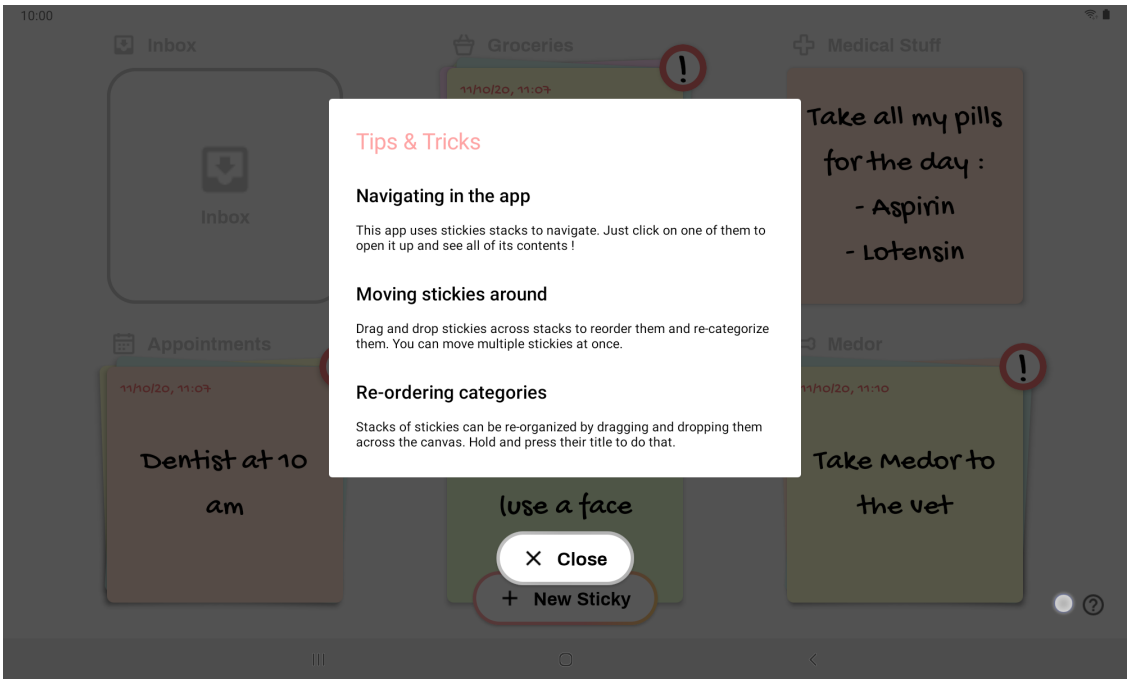

Figure 11: On the home page, a help button represented by a "?" can be found in the bottom right corner of the screen. It will open an overlay containing a few tips concerning hand gestures, which could be harder to pick up for a few people.