

Background

74% of our mobile users are from the United States (Intercom data). 61% of them are over 60 years of age ([survey](#)). According to [CDC statistics](#), 26% (1 in 4) of adults in the United States have some type of disability. 2 in 5 adults aged 65 years and older have a disability. In 2019, there were 2235 website accessibility lawsuits filed in federal and state courts ([UsableNet research](#)). These data alone should convince us of the importance of designing for accessibility.

Accessibility allows users of all abilities to understand, use and enjoy the product. Nixplay Smart frames are IoT devices. Just as websites and mobile apps should be accessible to everyone, so too should our IoT devices have an accessible user interface.

Guidelines

Based on the [WCAG guidelines](#) and some knowledgeable articles on IoT accessibility, this document aims to build a set of guidelines which Nixplay UXUI designers could follow and refer to again and again while creating designs for products.

Several layers of guidance are provided including overall principles, general guidelines and some proposed enhancement examples. At the top are four principles that provide the foundation for accessibility: *perceivable*, *operable*, *understandable*, and *robust*. See also [Understanding the Four Principles of Accessibility](#).

Under the principles are guidelines. The guidelines provide the basic goals that designers should work toward in order to make content more accessible to users with different disabilities.

1. Perceivable

Information and user interface components must be presentable to users in ways they can perceive.

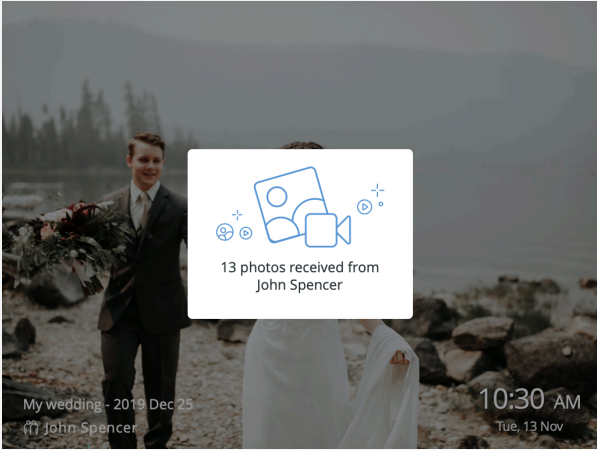
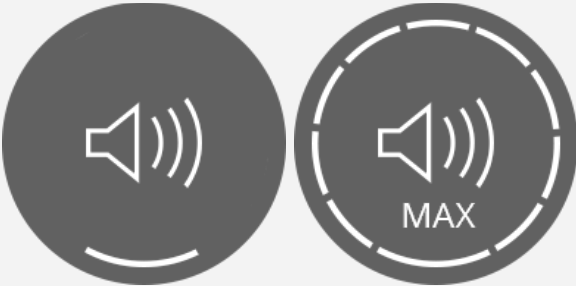
- This means that users must be able to perceive the information being presented (it can't be invisible to all of their senses)

Guideline 1.1 Text Alternatives

(Level A) Provide text alternatives for any non-text content so that it can be changed into other forms people need, such as large print, braille, speech, symbols or simpler language.

Proposed UX UI Enhancements

Function	Existing Screen	Proposal
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New Photos Received Popup		1. Play a special ringtone to help users easily recognize at a long distance. 2. Use a larger font size and icon to show the key info. 
Volume Adjustment		3. Play a sound feedback for volume adjustment

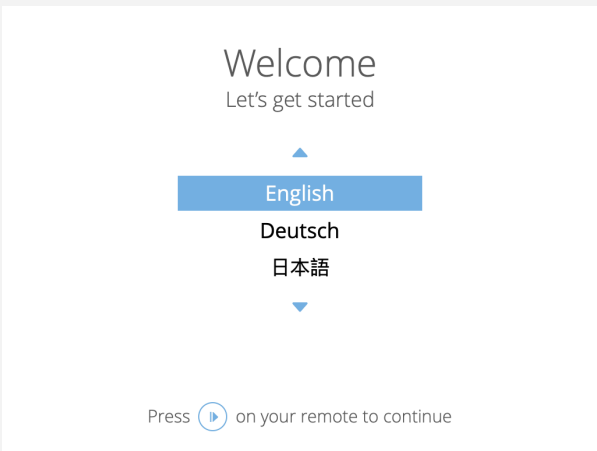
Guideline 1.2 Distinguishable

Make it easier for users to see and hear content including separating foreground from background.

1.2.1 Use of Color

(Level A) Color is not used as the only visual means of conveying information, indicating an action, prompting a response, or distinguishing a visual element.

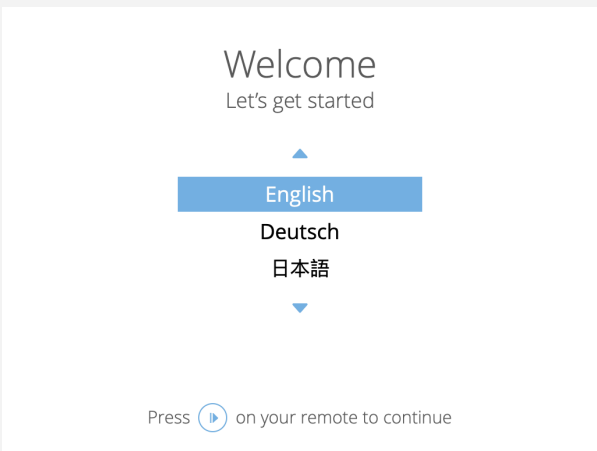
Function	Existing Screen	Proposal
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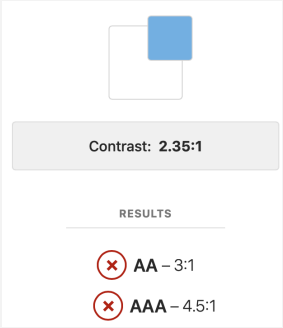
Use of color		4. Need a check mark for selected state?
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1.2.2 Contrast (Minimum)

(Level AA) The visual presentation of text and images of text has a contrast ratio of at least 4.5:1, except for the following:

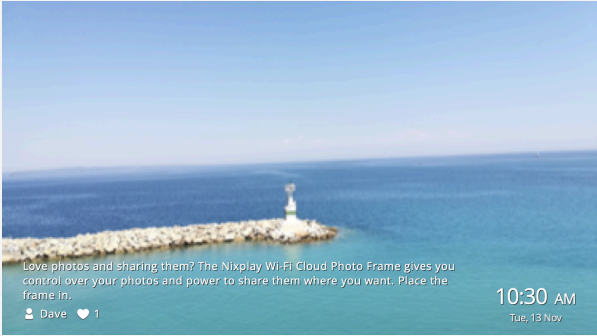
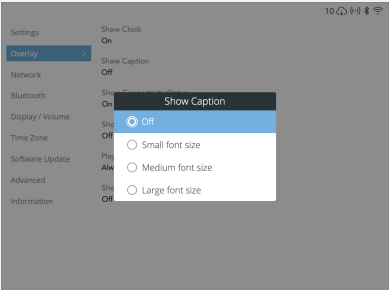
- **Large Text:** Large-scale text and images of large-scale text have a contrast ratio of at least 3:1;
- **Incidental:** Text or images of text that are part of an inactive user interface component, that are pure decoration, that are not visible to anyone, or that are part of a picture that contains significant other visual content, have no contrast requirement.
- **Logotypes:** Text that is part of a logo or brand name has no contrast requirement.

Function	Existing Screen	Proposal
Use of color		5. Replace the old blue with new mobile Nixplay blue

		
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1.2.3 Resize Text

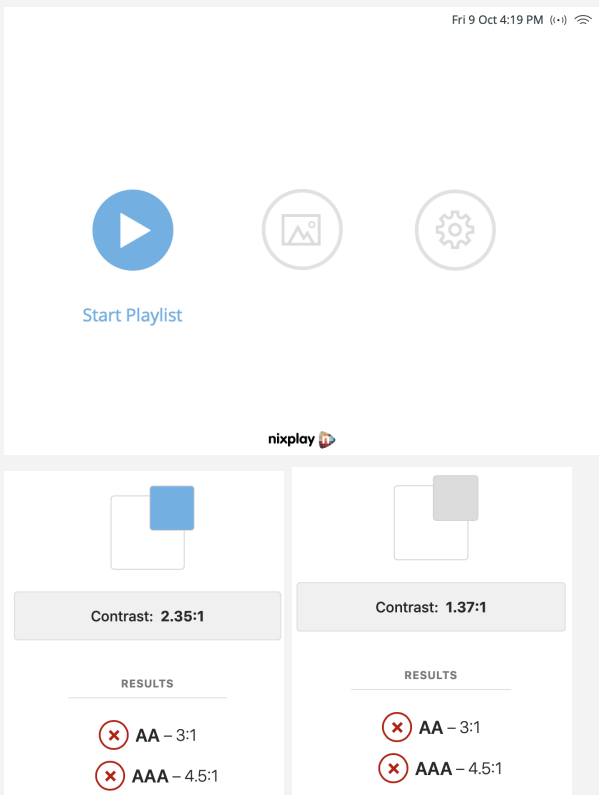
(Level AA) Except for captions and images of text, text can be resized without assistive technology up to 200 percent without loss of content or functionality.

Function	Existing Screen	Proposal
Change Caption/System Font Size		- Allow user to choose caption font size or even system font size - Default size to be large for our demographic   https://www.wrike.com/open.htm?id=335661335
Voice Caption		In detail mode, provide voice caption for current photo

1.2.4 Non-text Contrast

(Level AA) The visual presentation of the following have a contrast ratio of at least 3:1 against adjacent color(s):

- **User Interface Components:** Visual information required to identify user interface components and states, except for inactive components or where the appearance of the component is determined by the user agent and not modified by the author; eight
- **Graphical Objects:** Parts of graphics required to understand the content, except when a particular presentation of graphics is essential to the information being conveyed.

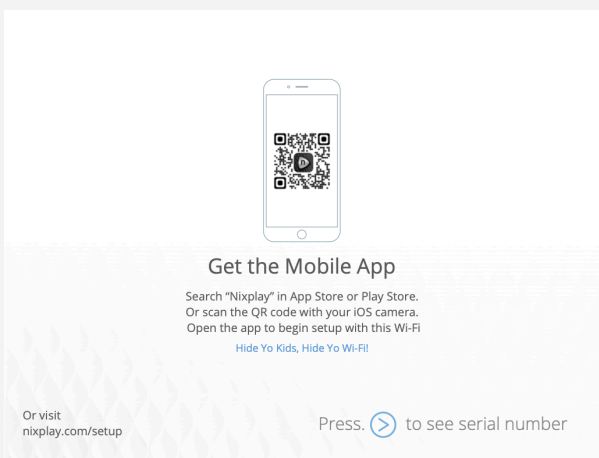
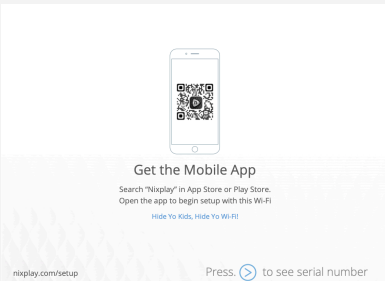
Function	Existing Screen	Proposal
		9. Replace the old blue with new mobile Nixplay blue 10. Darken the grey shades of frame components. https://www.wrike.com/open.htm?id=330556801 Existing Icons (total 165): https://docs.google.com/document/d/1dh5kKm84TO0Co2pt0giidrBH5kCO7GFxE1UaJWX3pg/edit?usp=sharing

1.2.5 Text Spacing

(Level AA) In content implemented using markup languages that support the following text style properties, no loss of content or functionality occurs by setting all of the following and by changing no other style property:

- Line height (line spacing) to at least 1.5 times the font size;
- Spacing following paragraphs to at least 2 times the font size;
- Letter spacing (tracking) to at least 0.12 times the font size;
- Word spacing to at least 0.16 times the font size.

Exception: Human languages and scripts that do not make use of one or more of these text style properties in written text can conform using only the properties that exist for that combination of language and script.

Function	Existing Screen	Proposal
		11. Reduce instruction lines 12. Increase line height to 1.5 times 

2. Operable

User interface components and navigation must be operable.

- This means that users must be able to operate the interface (the interface cannot require interaction that a user cannot perform)

Guideline 2.1 Enough Time

Provide users enough time to read and use content.

2.1.1 Timing Adjustable

(Level A) For each time limit that is set by the content, at least one of the following is true:

- **Turn off:** The user is allowed to turn off the time limit before encountering it; or

- **Adjust:** The user is allowed to adjust the time limit before encountering it over a wide range that is at least ten times the length of the default setting; or
- **Extend:** The user is warned before time expires and given at least 20 seconds to extend the time limit with a simple action (for example, "press the play/pause button"), and the user is allowed to extend the time limit at least ten times; or
- **Real-time Exception:** The time limit is a required part of a real-time event (for example, an auction), and no alternative to the time limit is possible; or
- **Essential Exception:** The time limit is essential and extending it would invalidate the activity; or
- **20 Hour Exception:** The time limit is longer than 20 hours.

2.1.2 Pause, Stop, Hide

(Level A) For moving, blinking, scrolling, or auto-updating information, all of the following are true:

- **Moving, blinking, scrolling:** For any moving, blinking or scrolling information that (1) starts automatically, (2) lasts more than five seconds, and (3) is presented in parallel with other content, there is a mechanism for the user to pause, stop, or hide it unless the movement, blinking, or scrolling is part of an activity where it is essential; and
- **Auto-updating:** For any auto-updating information that (1) starts automatically and (2) is presented in parallel with other content, there is a mechanism for the user to pause, stop, or hide it or to control the frequency of the update unless the auto-updating is part of an activity where it is essential.

Function	Existing Screen	Proposal
Details Mode Time Out		13. Set a time limit in details mode

Spotify Mini Badge		14. Be able to hide or minimize the badge
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Guideline 2.2 Navigable

2.2.1 Page Titled

(Level A) Web pages have titles that describe topic or purpose.

2.2.2 Focus Order

(Level A) If a Web page can be navigated sequentially and the navigation sequences affect meaning or operation, focusable components receive focus in an order that preserves meaning and operability.

2.2.3 Headings and Labels

(Level AA) Headings and labels describe topic or purpose.

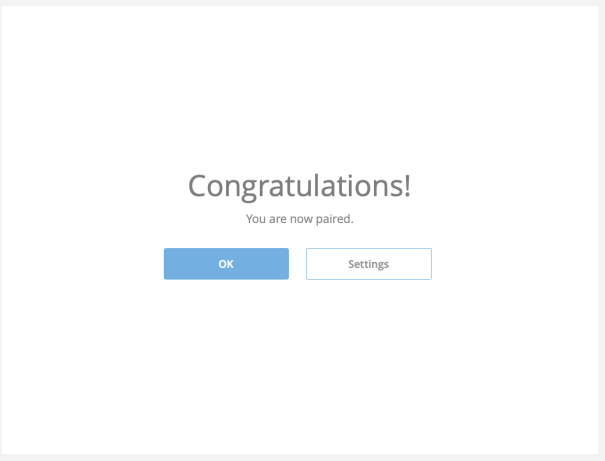
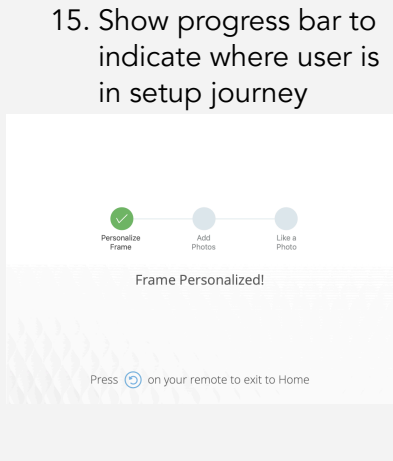
2.2.4 Focus Visible

(Level AA) Any keyboard operable user interface has a mode of operation where the keyboard focus indicator is visible.

2.2.5 Location

(Level AAA) Information about the user's location within a set of Web pages is available.

Function	Existing Screen	Proposal
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Pair frame Success		15. Show progress bar to indicate where user is in setup journey 
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2.2.6 Section Headings

(Level AAA) Section headings are used to organize the content.

Guideline 2.3 Input Modalities

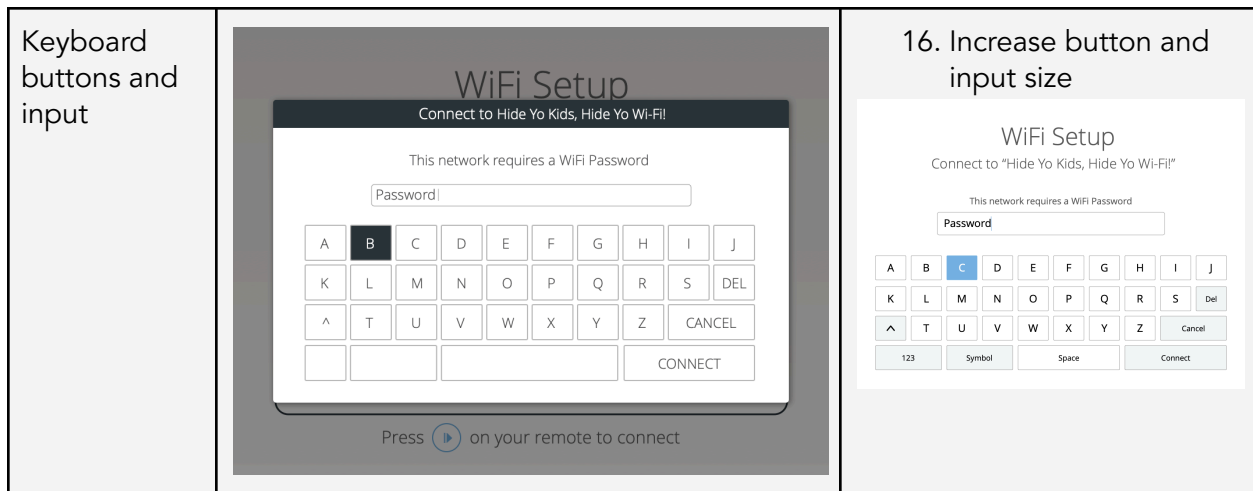
Make it easier for users to operate functionality through various inputs beyond keyboard.

2.3.1 Target Size

(Level AAA) The size of the target for pointer inputs is at least 44 by 44 CSS pixels except when:

- **Equivalent:** The target is available through an equivalent link or control on the same page that is at least 44 by 44 CSS pixels;
- **Inline:** The target is in a sentence or block of text;
- **User Agent Control:** The size of the target is determined by the user agent and is not modified by the author;
- **Essential:** A particular presentation of the target is essential to the information being conveyed.

Function	Existing Screen	Proposal
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3. Understandable

Information and the operation of user interface must be understandable.

- This means that users must be able to understand the information as well as the operation of the user interface (the content or operation cannot be beyond their understanding)

Guideline 3.1 Readable

Make text content readable and understandable.

3.1.1 Language of Page

(Level A) The default human language of each Web page can be programmatically determined.

3.1.2 Language of Parts

(Level AA) The human language of each passage or phrase in the content can be programmatically determined except for proper names, technical terms, words of indeterminate language, and words or phrases that have become part of the vernacular of the immediately surrounding text.

3.1.3 Unusual Words

(Level AAA) A mechanism is available for identifying specific definitions of words or phrases used in an unusual or restricted way, including idioms and jargon.

3.1.4 Abbreviations

(Level AAA) A mechanism for identifying the expanded form or meaning of abbreviations is available.

3.1.5 Reading Level

(Level AAA) When text requires reading ability more advanced than the lower secondary education level after removal of proper names and titles, supplemental content, or a version that does not require reading ability more advanced than the lower secondary education level, is available.

Guideline 3.2 Input Assistance

Help users avoid and correct mistakes.

3.2.1 Error Suggestion

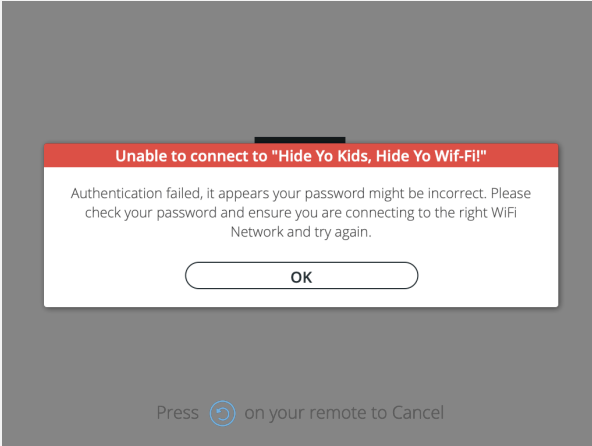
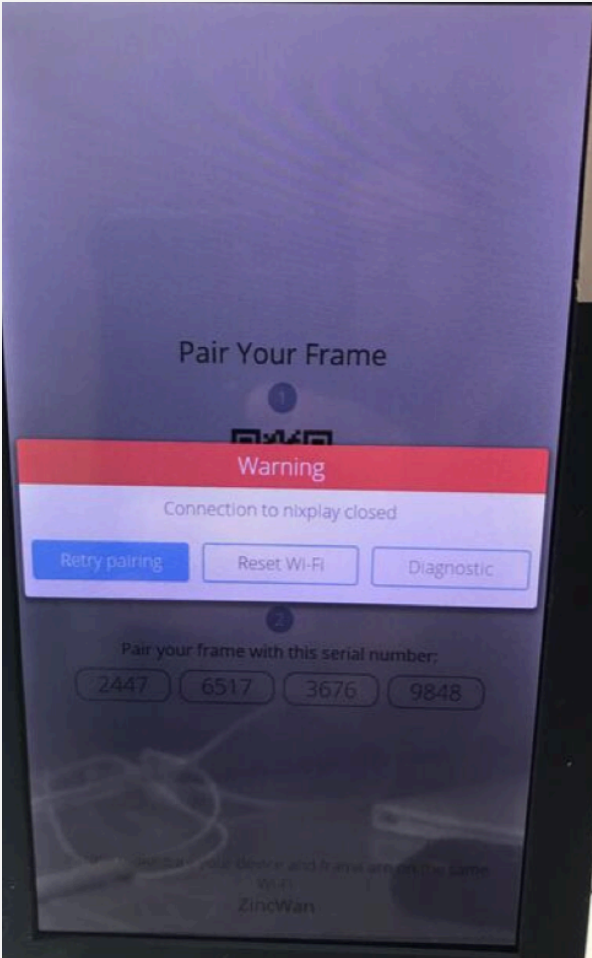
(Level AA) If an input error is automatically detected and suggestions for correction are known, then the suggestions are provided to the user, unless it would jeopardize the security or purpose of the content.

Function	Existing Screen	Proposal
		17.

3.2.2 Help

(Level AAA) Context-sensitive help is available.

Function	Existing Screen	Proposal
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WiFi Connection error		18. Provide "Get Help" KB articles on frame for WiFi connection error 19. Add CS contact number?
Pair Frame error		20. Provide "Get Help" KB articles on frame for Pair frame error