Project 3 – Group 8

User Analysis

User Group: Children from many nationalities and cultures.

Expressed Needs:

* To communicate with other children.
* To have fun.

Felt needs:

* To be able to express themselves fully, to communicate their experience of the world.
* To be understood, even by others who do not speak their language.
* To feel enabled and empowered to do something they haven't done before.

Special Considerations:

* Children may not be able to read well or at all so the interface must use primarily graphics and audio, not text. Also, children must be able to use the interface without reading any instructions. If help is required, there should be an option to read the help aloud.
* Children expect instant results to their actions and frequent feedback.
* Depending on the age of the child, they may not understand certain abstract concepts.
* Children may immerse themselves fully in any metaphor the interface may use and expect the metaphor to behave exactly like the real-life counterpart.
* Young children are not as coordinated as adults. On-screen targets need to be larger and further apart to allow for inaccuracy.
* Children have a preference for direct manipulation-type interface controls.
* Because they are from many cultures and nationalities, interface components need to be as universally recognizable as possible.

User Characteristics	
Age Group	6-12 years
Sex	Both male and female
Culture	Various
Physical limitations	Because they are children, the users will all be much smaller than an average adult. They have smaller hands and have less dexterity and less physical endurance than an adult. Some of the children may have physical limitations such as wheelchair use or limited movement. Children will be of varying heights and have varying reach.
Educational Background	Elementary school or less. The children may not know how to spell or read more than a few basic words.
Computer/IT use	Some of the older children may be very comfortable with computers and other technology, but the youngest will have almost no experience with them. It is unlikely even the most experienced children will have a sophisticated understanding of how computers work.
Motivation	The children will likely be motivated to use the system because they will be curious and will want to make new friends and communicate with other children.
Attitude	The children should feel curious, engaged, and entertained by the system. If the system does not engage and entertain them, the children are likely to lose interest and stop using it.

Task Analysis

Goal: For one user to communicate with another user across a distance without a shared spoken or written language.

Sub-Tasks:

1. Create a self-identity (an avatar)
    a. Choose eyes, ears, nose, mouth, and optional expression.
2. Find symbols that express the idea the user wants to communicate.
    a. Say or type the desired word.
    b. Select the best symbol from the list of results.
3. Compose the symbols into a message.
    a. Drag a symbol onto the message area.
    b. Find and drag another symbol onto the message area. Choose to either associate the new symbol with the previous to form a compound idea, or not to associate the symbols indicating they are separate thoughts.
4. Send the message to another user.

Task Characteristics	
How much does the task vary?	The actions stay essentially the same, but the specific message created will vary each time.
How often is the task done?	The task as a whole is done infrequently. The system is intended as a novelty toy, not as a regular form of communication. However, children will frequently do the sub-task of finding and selecting a symbol.
What skills or knowledge are needed for this task?	Children will need to be able to recognize pictures and understand that they represent real things. Children will need to be able to classify things into categories. For instance, they will need to understand that a dog, a parrot, and squirrel are all animals. They also will have to be able to understand the concept of speaking with someone who is in a different physical location from them.
How is performing the task affected by the environment?	Children may be easily distracted by other people and events around them. If the system is used in a public place, such as an International Children's Festival, there will need to be appropriate sized chairs or steps to allow children of various heights to use the interface. Also, if the system is in a public, there may be significant surrounding noise. Any audio feedback from the system will have to be adjusted to an appropriate volume or there will need to be ear phones.
How time critical is the task?	The task itself is not time critical. However, children will lose interest if they if the task takes too long to complete.
Are there any safety or security risks?	Yes. Parents will be very concerned about protecting the identity of their children and

	shielding the children from any inappropriate content. The system should go to significant lengths to ensure that no one can use it to exploit or take advantage of the children.
Is the task done in groups or alone?	The youngest children (5-8) will most likely have an adult supervising them while they are doing the task. Older children (9-12) may do the task alone or with an adult. Curiosity may lead other children - siblings, classmates, or friends - to cluster around the child involved in the task and offer input or try to participate as well.
Will users be switching between tasks?	Barring distractions, the children will not be switching between tasks.

Task Object	Attributes	Actions
Message	Symbols with associations Sender Receiver	Create Edit View Save Send Receive
Avatar(s)	Name Picture - hair - eyes - ears - nose - mouth	Create Edit View Save Use
Symbol	Icon Meaning Sound (optional) Associated symbols	View Select Edit Save
Sender	Avatar Language	Create Edit View Save

Revisions:

We originally planned to represent the child receiving the message (Receiver) as well. To simplify the interface, we decided that all messages would either be displayed on a large public screen if this UI is used at a museum or fair. Or, if the UI is used in a less public space, the system will directly connect two users randomly and let them send messages back and forth.

We also added an associative property to all the symbols to carry more semantic meaning. So, now, for instance, the symbol for sandwich could have some association with Ben's avatar, to mean that Ben had or ate a sandwich.

Use Cases

Essential Use Case

User Purpose	System Responsibility
Indicate native language	Modify interactions to user's preferred language.
Understand what the application can do.	Show/teach children what they can do.
Express a sentence or idea.	Allow the expression of a wide range of ideas. Combine atomic elements of the idea (i.e. words) in a way that carries the child's intended meaning. Display a representation of the child's idea.
Communicate their idea to another child.	Send a language-independent representation of the idea to another child.

Concrete Use Case for Our Interface

User Action	System Response
Say or select preferred language.	Greet child in appropriate language. Display quick animation explaining how to use the system.
Watches tutorial	Displays and reads instructions in selected language
Create a self-representation (avatar) • Select eyes • Select nose • Select mouth • Select hair	Show the results of each change immediately. Save the avatar and display it for use in the sentence creation area.
REPEAT • Find an icon by searching or browsing • Place icon in message UNTIL idea is complete	Show icon in message where user placed it. Automatically scroll message area if current working area gets too full.
Send message	Confirm message sent. Return to Choose Your Language screen.

Design Rationale

The general rules we were following in the design of the project was, although there were several behaviors for a given action, the same general mechanic will be used.

GENERAL USAGE AND WHAT NOT

SENTENCE

INTERACTION

Dragndrop (sticky)
- Both
- Interactive
- Animated
- LoC
- Immediate feedback\
- Icon goes exactly where they want
- Direct manip and simple
- Single button

Audio input for search and answers
- Incase of professor brown
- Or spell
- Or type

Dropping on something vs. off
- Intuitive association
- Feedback
- Image/placement feedback for interaction

Typing
- Consistency with any previous computer use
- (re)Enforces literacy
- Complicated input
- failsafe

Buttons
- Consistency with any previous computer use
- Affordabilties
- These buttons were made for pushin'
- Simple required knowledge
- Teaches computer use 101

FIRST SCREEN: (add tutorial)

The primary purpose of the first screen is language selection. Though there are very few parts of the interface that are completely linguistic, the speech recognition would have to be. On the system side of things, the default language(s) would be preselected by whoever installed the interface and can easily be changed so that there would not necessarily be a bias towards English.

The opening screen also had to be enticing enough for a child to want to use it. In addition to being visually appealing, there would be musak looping through the background, interspersing languages throughout in order to prompt children who cannot read to respond to the spoken word. The default languages would also be looped through in this way.

AVATAR CREATION:

The avatar creation page is to more tightly connect the user with the task at hand. It makes the story telling more personal and is essentially the signature.

The avatar is the method for dealing with proper nouns, specifically names. It allows the user to create a digital representation of themselves and eventually their friends. The first avatar created is the representation of the user and is drawn differently on the main screen.

In addition to all this, creating an avatar in a Mr. Potato Head or Mii manner is fun. The idea of using webcam pictures, but an abstract cartoon was deemed more appropriate for children to send out.

As the options are changed, the face on the screen changes as an easy feedback for the changes the user made.

Also, the default face is set to random so that there is no cultural or racial bias.

Done button, face+check mark

MAIN SCREEN:

The main screen….

Search Bar:

Search text field small

Limits length of input

Closely associated results, why they are next to each other

Matching icon for vocal search

Consistency

“what are you looking for?”
Magnifying glass plus text
    Interwebs say it is right

Search results
    Initial results are most common
    Most relevant is larger and centered
        Size denotes importance/revelance
            Relevance is by tag, use, and ….
        Equal for both left-right and right-left reading
        Fitt’s law
    Mousing over expands each icon, mouse turns to hand icon, pops out to imply grabable
    Bordering message area = draggable

Canvas:
    Rectangular to imply more of a drawing, less like a linear sentence
        Kids don’t organize thoughts linearly
    Scrollable in case they have a lot to say
        Infinite blank area
        Freedom aka locus of control
    See sentence structure

Trash:
    Allows deletion
        Deleting is good
    Big cause fitt’s
    Fleshes out screen. Martha stewart would be proud

Avatar’s
    People are most important
    Allows child to see themselves/find themselves and/or friends
    Compensates for names
    Saves for quick use
    Should be fun, look at mii’s
    Creation button mostly universal
        Question mark has propagated
    Kid’s avatar in diamond to make it special
        Good point of reference for top

Scroll is long to add more realestate without making too large
Universal language of pointing

Icon description: dictionary for icons

- Tells them about new words
  - Teaches!
  - Cultural education!
- Feedback on choices
- Frame of references for what they last used
  - In case distracted

Toolbar:

- Zooming for canvas
  - They may have a lot of stuff
  - Fun interaction
  - Everyone loves zoom
- Clear screen
  - Audio/popup confirmation question
  - Allows quick reset
- Send
  - Pointless software without

METRICS

LAYOUT UNIFORMITY:

Language Selection: N/A, only a single element apart from background
Tutorial: N/A, only a single element apart from background

Avatar Creation:

$N_c = 8$ (each face field, color selection, avatar, commit button, shuffle button)
$N_h = 4$
$N_w = 4$
$N_t = 6$
$N_l = 5$
$N_b = 8$
$N_r = 3$
$M = 2+2*ciel(2*sqrt(N_c))$

Answer = $100*(1-(N_h+N_w…-M)/(6* N_c-M)))$

Main screen:

$N_c = 7$ (search, search results, toolbar, canvas, avatar, new avatar, and trash)
$N_h = 4$
$N_w = 5$
$N_t = 4$
$N_l = 4$
$N_b = 4$
$N_r = 4$
$M = 14$

Answer = 60.7%

$M = 2+2*ciel(2*sqrt(N_c))$

Answer = $100*(1-(N_h+N_w…-M)/(6* N_c-M)))$

TASK VISIBILITY:

Language Selection:

Tutorial: 100% (continue button always visible)

Avatar Creation:

Main screen:

S = Number of steps for use cases
v_i = Feature visibility per step

100*(1/S*sum(vi))

IMAGES NEEDED: ROUGH AND FINAL FOR ALL IMAGES

Step by step sentence creation
Example sentence final in multiple forms

Random other sentence

Cite images

http://www.coloring.com/color/hwfranknbride