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# Tele-Story

*Reading together while apart*

M3:  
Design

HCI  
Capstone

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## Summary

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The primary users of *Tele-Story* consist of children ages 0 through 7 who enjoy having books read aloud to them, and members of their family circle of reading age that want to form a connection to the children by recording a story for them. These family circle members may live or be traveling far away from the child, making it difficult to manage quality, real-time interaction. *Tele-Story* helps members within a child's family circle experience the joy of sharing stories in the timeless tradition of reading aloud.

From a touchscreen interface, users select an e-book, record their voice reading the book, along with all the personal commentary that makes reading together a close experience; then, send the book to a child. The child that receives the book can access it from another device, listen to it, and, then, send a thank you note back.

The design of *Tele-Story* must provide a physically and socially healthy environment for users from early developmental stages of childhood (Huitt & Hummel, 2003) and users of reading age, which can span from slightly older children to the aged, to interact with each other through the joy of reading together.

## User Stories

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### Approach

The user requirements in this section were developed using an Agile Methodology approach wherein stories identify the user, the requirement, and the benefit gained. I have grouped the stories into epics based on the user role to help me identify stories that are similar enough to share the same design space and keep the user experiences closely aligned.

### Browser Stories

#### Users Goals

- As a family circle member living or traveling far away from a loved one, I want to browse a library of available e-books with the intent of selecting one or more for recording a personalized audiobook for my loved one.
- As a child living or traveling far away from a loved one, I want to browse a library of available personalized audiobooks with the intent of selecting one to listen to.

#### Initial Implementation

- As a browser in search of a story to record, I want to be able to select the child to whom I want to send a recorded story so that I will be presented with options appropriate for that child AND know that the child has not received that story already.
- As a browser in search of a story to record, I want to be able to select a suitable story to record for a child so that I can give a gift that is age-appropriate for the child.
- As a browser in search of a story to record, I want to be able to select a suitable story to record for a child so that I can give a gift that is age-appropriate for the child and relates to the child's interests.
- As a browser in search of a story to record, I want to be able to select a story from a wish list created for a specific child so that I can give a gift that has been requested.
- As a browser in search of a story to record, I want to be able to review a summary of a story before I select it so I can determine if I want to read it or select another.

- As a browser in search of a story to record, I want to be able to read a story before recording it so I can determine if I want to record this story or select another.
- As a browser who wants to listen to a story, I want to be able to easily find new stories that have been recorded for me so I can have a new listening experience.
- As a browser that wants to listen to a story, I want to be able to easily find stories that I have listened to already so I can hear them again and again as children are want to do.
- As a browser that is not in a place suitable for recording or listening, I want to save a story to use later.
- As a browser that saved a story earlier, I want to find my saved stories to finish my task.
- As a browser that wants to hear a new story, I want to be able to save stories to a wish list so one of my family circle members will record it for me.
- As a browser that wants help selecting a story to record, I want to be able to select one from a child's wish list.

#### ***Stretch Goal / Future, Related Stories:***

In future, I will create browser stories that will support:

- Selecting a story to add to a family library so that the gift is for more than one child
- Selecting a story from a family library so that my siblings and I learn to share
- Selecting a chapter book that can be read and delivered in parts, eventually forming a whole book (This story will target older children and increase interaction between participants.)
- Selecting an animated clip to narrate for the child

#### **Recorder Stories**

##### **User Goal**

As a family circle member living or traveling far away from a loved one, I want to create and deliver a recording of a story for a child so that we can share an experience that transcends time and geographic limitations.

##### **Initial Implementation**

- As a recorder, I want the options to start, pause, resume, and end recording so that I can attend to interruptions to the recording session.
- As a recorder, I want the option to page backward or forward when I am paused or have ended the recording so that I can review the story in case I become confused or want to check something.
- As a recorder, I want the option to discard a recording in progress so that I may start over if I desire to or choose another story to record.

#### ***Stretch Goal / Future, Related Stories:***

In future, I will create recorder stories that will support:

- Editing the recording for a specific page
- Adding a "point to" feature so the reader can touch an area of interest. When the listener hears the story, a visual cue, such as adding a shadow effect to "float" the item on the page, will draw the listener's eyes to the item. Additionally, this could lead to increasing social interaction experiences by having the reader prompt the listener to point to an image or word.

## Listener Stories

### User Goal

As a child living or traveling far away from a loved one, I want to listen to a recording of a story from a loved one so that I can feel connected to them.

### Initial Implementation

- As a listener, I want the options to start, pause, resume, and stop listening to a story so that I can attend to interruptions to the listening session.
- As a listener, I want the option to page backward or forward as I listen to the story so that I can hear parts again.
- As a listener, when a story ends, I want the option to listen to the story again or choose another story to hear.

### Stretch Goal / Future, Related Stories:

In future, I will create listener stories that will support:

- As an add-on to the “point to” story described for recorders, listeners will touch an image or word when prompted by the recorder and score points that are reported by to the recorder

## Sender Stories

### Initial Implementation

- As a sender of a recorded story, I want the option to make the story available to the target library immediately so that I can connect to my loved one as soon as possible.
- As a sender of a recorded story, I want the option to choose a specific date to make the story available in the target library so that the story can be a gift for a special occasion, such as a birthday.
- As a sender of a thank you message, I want the recipient to know which story I listened to, who the message is from, and to know I appreciate it, so that the overall experience is shared one AND I can demonstrate that I’m learning to mind my manners.
- As a sender of a thank you message, I want recipient to see the total number of times I listened to this story so they know how much I love it.

### Stretch Goal / Future, Related Stories:

In future, I will create sender stories that will support:

- Gifted stories can appear in gift wrap with a “From:” tag showing the sender’s picture and/or name
- Recording a voice message

## Design Space

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### Design Tradeoffs

#### Shared Experiences vs. Accessibility

A primary goal of *Tele-Story* is for loved ones to share experiences. As such, I want the user interface for all users within the primary task flows to provide similar and same experiences, so that when a child talks about the experience, the other users know exactly what he heard and saw.

To address the child user needs for *Tele-Story*, I will use design principles to accommodate the two stages of childhood development described by Jean Piaget pertinent to infants (sensorimotor stage) and toddlers through early childhood (pre-operational stage) (Huitt & Hummel, 2003).

As the child users that listen to stories are likely to be non-readers or beginning readers, calls to action in the user interface (UI) will need to graphical images without textual prompts (Jarrett & Summers, 2010). Navigational options must be kept minimal so that the experience is guided from a logical beginning to a logical conclusion and easy to repeat.

The adult users that make recordings will need some tips and instructions to get started or reminded of how to complete a task. Typically, this information could be captured in field or button labels accompanied by minimal tasks. To align the experiences between the child listener and the adult recorder, I will include a sample audiobook that is a *Tips & Tutorial Guide* that all users have access. This solution will support the children that are bridging from listener to recorder. If labels and text are still necessary, I will use vocabulary suitable for beginning readers.

Using a wizard approach, I will be able to guide all users to share a common starting point and end.

#### Skeumorphic Charm vs. Usability

Adult users expressed the desire to instill a love of books in children, including the experience of trips to bookstore or library. Brick and mortar bookstores are near extinction and libraries are staying relevant by offering access to computers and creating an atmosphere more similar to a coffee shop (F4) than a traditional, hushed library. (Tucker-Reid Library, 2016). To accommodate this request, the first page of the application will appear as a bookstore or library. Even though it will not have functionality other than *Enter Site*, users expressed the desire to have it. An inactive adult user asked if it could look like the exterior of an old, Parisian bookstore.



Figure 1. Tucker-Reid Library, Dekalb County, Georgia

Commonly used skeuomorphic designs to support the traditional browsing and reading experience include displaying books on a virtual shelf and using the turning-page feature where the corner of a page appears to curl up.

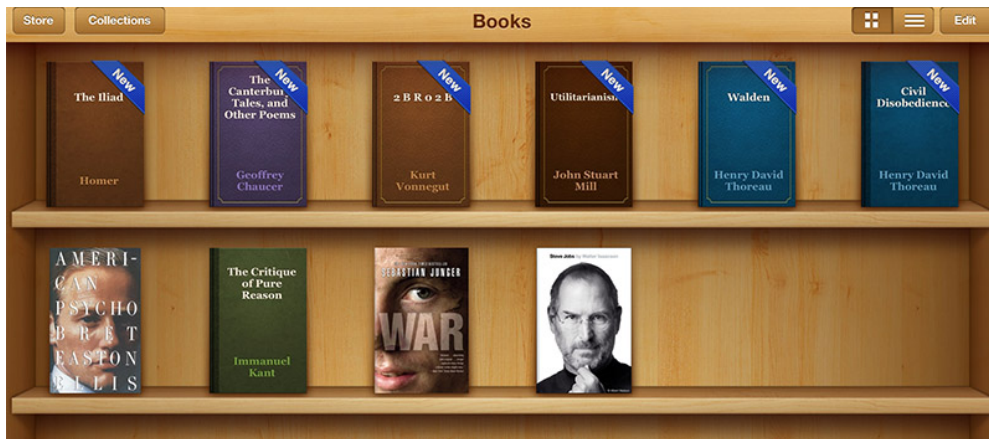


Figure 2. Apple's iOS Book Shelf Prior to iOS7

These designs, such as the virtual bookshelf shown in Figure 5, do not have the relevance to the child users of *Tele-Story* that they do to the adults. For the young users, I want to minimize visual clutter, especially where calls to action are presented. I plan to present books in horizontal, scrolling rows with a banner background that can help a child easily recognize his or her personal shelf.

### Security vs. Independence

As a cloud service or e-commerce application where the primary users are children, the application must be setup and managed by a parent, or legal guardian, before stories can be shared from one user with another. All user profiles, including those of the Family Circle Members, will need to be created by the parent in order to create a secure network accessible only by members.

### Hard Requirements

#### Account Management (Setup and Configuration)

The most difficult user stories will be those performed by the parent in the role of account manager. Scenarios for the account manager role include setting up the family circle network, which includes creating profiles, managing profile pictures or avatars, setting up preferences and rules to aid in story selection. Additionally, these users will be the account holders that manage the payment information. Though account management requirements will need to be implemented prior to launching the application, I prefer to address these after requirements for primary users near completion, as those requirements lead to discovery for the account management requirements.

#### Recording a Story

The epic for Recording a Story will require integrating stories for choosing a library (recipient), choosing a book, recording, and then sending the recording. Since the user is creating a product instead of consuming one, the flows must accommodate many alternate flows, which will introduce opportunities for failure.

#### Visual Design

The most common scenario I use to explain the *Tele-Story* concept is enabling a grandparent to record a story for a small child. This specific scenario justifies the need for keeping calls to action and sequence of tasks very clear and basic. Two euphemisms I am invoking as mantras as I approach the visual design are:

- A picture is worth a thousand words
- Keep it simple

## The Design

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### Overview

As the concept of *Tele-Story* is a new one, the design discussion in this section represents the initial design. Several of the harder design decisions have been reviewed with adult users using low fidelity mock-ups. The reviewers all preferred easy-to-use solutions over having flexibility and control. Specifically, in the Record a Story task flow, users prefer to record one page at a time rather than have the entire story recorded in a single recording session. This tradeoff results in three calls to action per page (start recording, stop recording, turn page) versus one (turn page). This solution prevents exposing the task to many corner cases that would involve pausing, resuming, stopping session prior to completion, and saving. Though the 3-action solution requires a series of starts and stops, users do not think the quality of the recording will be inferior. They predict this solution will increase their comfort level for reading aloud and give them confidence that mess-ups will be easier to fix.

Task flows are designed to follow a wizard approach so that a user moves forward or backward within the flow. Calls to action are primarily images: photos or avatars of members in the private network or storybook covers. Common media controls are used for recording and playing recordings. Common navigational arrows are used to indicate paging backward and forward within a task flow. Some unique buttons will need to be designed for sending the thank you messages and confirming the action. Calls to action at the end of the recording session mix unique images with commonly used icons. A graphic designer will be needed to address look-and-feel disparity.

### Getting Started

To start the journey into design, I want to work with the listener scenarios first. Even though these users will have the fewest choices / decisions to make, starting with this user group will help me set up design principles for the users that have accessibility limitations. Within the listener group, there are two categories:

1. Child users in the sensorimotor stage of childhood development
2. Child users in pre-operational stages of childhood development

We can assume that child users in the sensorimotor stage (infants) require assistance, and therefore, are not the hands-on users navigating the application. The child users of group 2 range in age from 3 years of age to 7. Of this group, we can assume that the younger children, ages 2 through 4 (toddlers), may also require assistance. By these guidelines, we have determined that the child users that may be able to use *Tele-Story* without assistance may be as young as 5. For the first phase of design, I will focus on functionality that is learnable through self-discovery for 5 year olds. As I want the design to be inclusive through 7 year olds, I will want the design to be appealing to 7 year olds and not look like a “baby toy.”

### Listen to a Story

The section details the design thought process for visualizing the user experience to listen to a story.

#### Scenario 1

Anne is 35. Her daughter Tam is 5. Anne’s mom, Judy, (Tam’s grandma) is 65. Anne and Tam live in north Georgia. Judy lives in Ft. Lauderdale, FL, in an independent-living retirement community. Judy is an active senior and loves using her iPad to keep in touch via Facebook, playing Kakuro, and reading detective stories. Judy has to watch her pennies and doesn’t like to drive long distances, so she only sees Anne and Tam two to four times a year. The family has tried to Skype to give Tam and Judy face time together. They are creative, and have learned to play checkers using Skype, but lately, it’s been hard to work out their schedules so they have more than 5 minutes together. Judy hears about *Tele-Story* from her neighbors in the retirement community. She tells Anne about it. Anne decides to set up a *Tele-Story* account where she will pay for the recordings Judy makes for Tam. She performs all of the account manager tasks so that she, Judy, and Tam have access on their individual



devices. This includes selecting avatars or adding photos of each account member. She sets up a library called *Tam's Library*.

### Scenario 1 Sketches

#### Overview

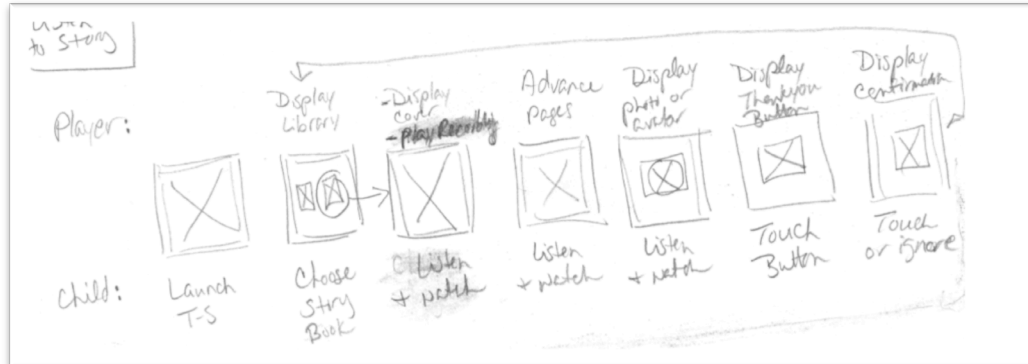


Figure 3. Scenario 1 Task Flow

#### Child User Steps

1. Touch anywhere on page to access your library



Figure 4. Home page

The home page uses skeumorphic design to appeal to users of all age groups by mimicking an old bookstore. Above the door there's an opportunity for personalization. For this scenario, it may say "Tam's Library." The default will be to use *Tele-Story* branding. Preferably, the user will need to touch the door to enter the site. This option will encourage discovery and train the user that location of taps matters. It would also allow for some "gamification" interaction in future. Usability testing of 5-year-olds will provide the feedback as to whether to make the door or the whole page the call to action. A great-grandmother user suggests that her picture appear in the shop window when she has sent a storybook to the child. The bike could be changed out periodically. Tomorrow, a dog could be sitting outside looking a cat in the window. Making elements on this page dynamic is an opportunity to create interest.

## 2. Choose storybook

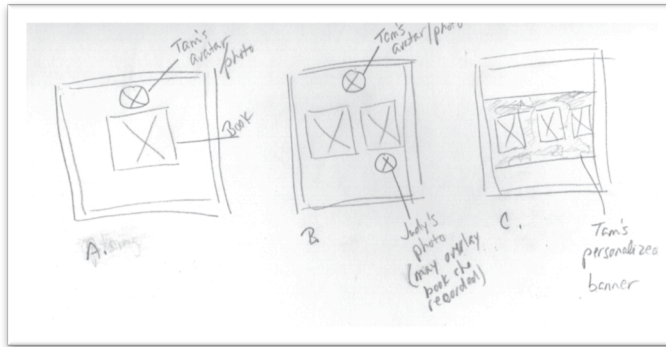


Figure 5. Options for view of Tam's Library

- Idea A (F5) is applicable if only one story is available. The UI elements are (1) an image representing that this is Tam's library and (2) a storybook to select. If a recording is not available, this will be a default, studio-produced audiobook that comes with installing the application. If users don't like the idea of having an impersonal storybook in the library, I will propose alternatives: (1) display a large button that could be used to take the user to an easy-to-browse library as step one in an add-to-wish-list flow; (2) display a large button that is sent to Judy to "ping" her to record Tam a story; (3) launch an add-to-wish-list flow (skipping library since it's empty).
- Idea B is applicable if 2 or more stories exist (if more, the book cover images would slide in horizontal, scrolling shelf). The Tam's photo or avatar is at the top to indicate this is her library. The story that Judy recorded has Judy's photo or avatar under it, or possibly hovering over it, to indicate that Grandma Judy recorded this for Tam. Usability tests will explore if the avatar/photos should be the same size, and if not, whose should be larger/smaller.
- Idea C includes a banner that the book images float above. This banner can be personalized with butterflies or bats and the like. As the family grows, Tam's sibling will have his or her own banner (below Tam's, of course). The avatar/photos of Tam and her sibling will be either at the top of the page, or remain fixed at the left of the banner, or hover over each banner (Tam's image over her banner; sibling's image over his/hers). As the potential for a cluttered screen seeps into the design, I continue to explore ways to scale it back, such as having individual versus family libraries. Working with the assumption that a library starts out small and grows, lends itself to organically supporting iterative user training.

## 3. Listen and Watch



Figure 6. Tele-Story plays recording and advances pages

*Tele-Story* will play Judy's recording of the book and advance the pages automatically. For initial implementation, the only calls to action are to pause/play/stop or adjust volume. I regard having any calls to action a tradeoff because keeping this truly simple would mean having the story play from beginning to end without interruption. As a product for small children, I do not want to hide calls to action, as I do not want to encourage tapping things without a task-related goal in mind. Unexpected results can lead to haphazard tapping just to see what happens. Focus and completion is important for users in the pre-operational stage of childhood development. When the story ends, *Tele-Story* displays a page with the Judy's photo or avatar and plays her closing words. The player controls are gone. A call to action image is on the page.

#### 4. Send thank you

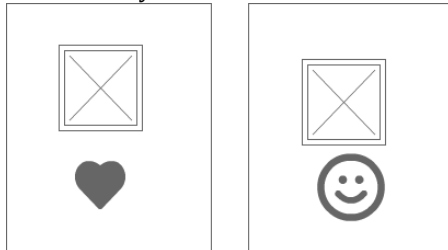


Figure 7. Thank you and confirmation views

Tam taps the graphic below Judy's avatar/photo. *Tele-Story* updates Judy view with a thank you message and updates a counter indicating how often this book has been read. *Tele-Story* presents another image to indicate, "sent." If Tam touches the image, her library will appear. If 8 seconds pass without an action, the library page will appear.

#### Record a Story

The section details the design thought process for visualizing the user experience to record to a story.

#### Scenario 2

Judy tells her friends at the retirement community about *Tele-Story*. Harry, age 71, loves books and is excited about reading for his grandkids that are all over the country. Harry sets up his own account and reaches out to his grown children to help him add profiles and libraries for all of his grandchildren. He has one library called The Swain Library that has profiles for his son and his son's 3 children in it. He has one called The Mills Library that has profiles for his daughter, her husband, and their 2 children in it. He has one set up for his other daughter and her one son (Joey, age 5) called Joey's Library. He worries that since Joey doesn't have any siblings yet, he may be lonelier than his other grandkids. He's glad that Joey loves book like he, Harry, does. He wants the first book he records to be for Joey. Once he finishes his first book for a single audience, he'll see about reading one book for all of his son's 3 children.

Scenario 2 Sketches

Overview

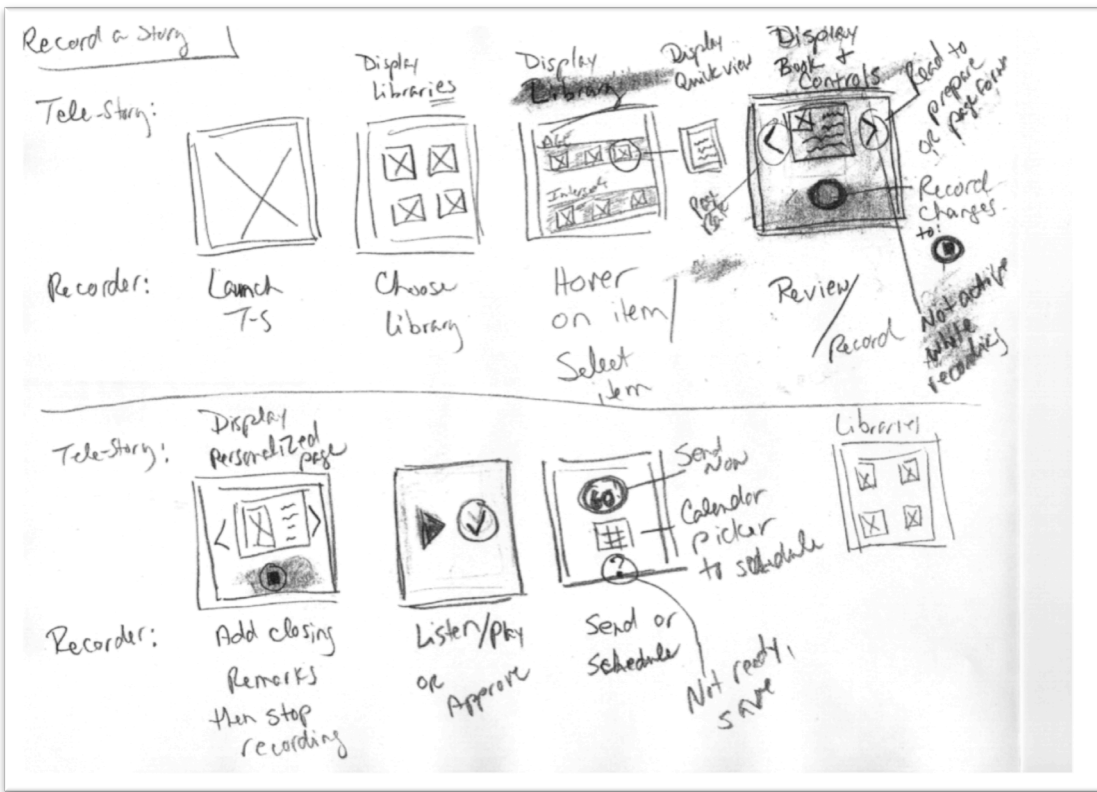


Figure 8. Overview of steps to record story

Reader User Steps

1. Touch anywhere on page to access available libraries



Figure 9. Home page

2. Choose library

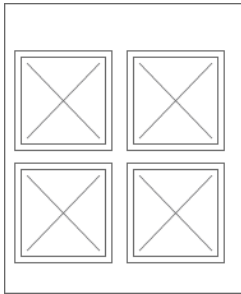


Figure 10. Libraries in recorder's private network

Images appear of the 3 libraries that Harry set up plus one for himself that is automatically set up for any account holder. Harry selects Joey's Library.

3. Choose a storybook

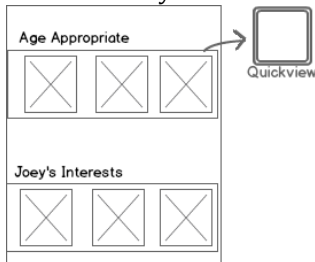


Figure 11. Library filtered for appropriate storybooks

In Harry's view, Joey's library includes books that are appropriate for Joey's age and books that are on topics that interest Joey. Both of these filters were set up when Harry and Joey's mom set up Joey's profile. Both filters (age and interests) will automatically adjust offerings based on Joey's age. Books that Joey already has recordings of will appear as disabled so Harry can keep track of books he and Joey's mom have already recorded. The books that have already been recorded will have a number overlay that indicates how many times Joey has listened to the book. Harry has the option to review a book before he selects it for recording.

4. Choose storybook

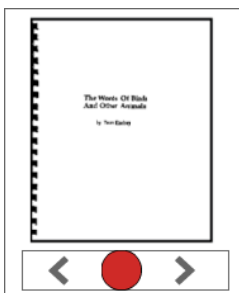


Figure 12. Recorder and page controls

Harry can use the page forward control to read the book to himself before he starts recording it. If he reads all the way to the end, he will be presented with the controls to page back one page at a time, or jump back to start. From the book cover view, the back control returns him to Joey's library. When he is ready to start recording, he clicks the record button. The button changes to a stop button (circle with a square in it) while a record is in process. While recording, the page forward and backward controls are disabled. When Harry is ready

to go to the next page, he stops recording and the forward/back controls are enabled. User reviews with low fidelity mockups revealed that recording one page at a time, each page individually, is easier than recording nonstop until the end then choosing pages to edit. Fewer controls are active each step along the way. Keeping the user on task with limited options is a tradeoff between easy-to-use and user control. Users interviewed prefer having an easy-to-use experience to having controls that confuse them and expose corner cases.

5. Add closing remarks and stop recording

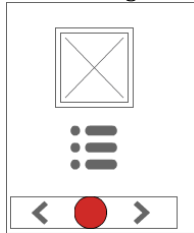


Figure 13. Closing remarks and stop recording

*Tele-Story* inserts a page at the end of the storybook that includes the recorder's avatar/photo. Tips for closing remarks are provided. The page forward/back controls are disabled while recording is in process. Harry tells Joey how much he enjoyed this story and can't wait to hear Joey's thoughts. Harry stops recording, and the page controls are enabled. Harry decides to go back to a page where he mispronounced a word. He records that page; then, jumps back to this page. He clicks the page forward control.

6. Finish recording session

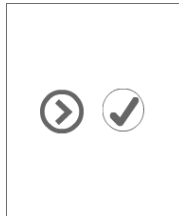
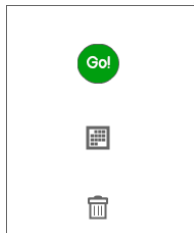


Figure 14. Listen and confirm done

*Tele-Story* presents options for Harry to play his recording or indicate, "done." Harry chooses to play his recording. As the recording plays, Harry is presented with the option to stop on any page, record it, or page back and forward (very similar to recording options, only now Harry gets to listen instead of reading aloud). When the recording is done, Harry is returned to this page (F14). Harry clicks the check mark to indicate he's done recording.

7. Schedule delivery



Harry is presented with options to send the recording to Joey immediately (Go! button), or to schedule an availability date (calendar picker icon), or to discard the recording (trashcan). Selecting any of the options results in a confirmation prompt. As there are several arrow images used throughout the flow for paging back and forth and to replay recording, I did not want to add another arrow to denote the "send" action. Harry selects go and confirms the action. *Tele-Story* returns Harry to the Choose Library page.

## Future Technologies

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Throughout my course study at Iowa State, I have gravitated toward studying usability for the elderly, beginning with an assignment in Dr. Satterfield's HCI 595x class. As such, I have started keeping abreast of several technologies geared toward improving the quality of life for seniors living in isolation and/or suffering from Alzheimer's and other forms of dementia. I am particularly drawn to ideas that address the problem of seniors living apart from loved ones. Ergo, *Tele-Story* emerged.

Following are some projects and research that have touch points with *Tele-Story*:

- *StoryHome* is a venture underway for developing a storytelling device for distanced relatives to connect with children by sharing stories. The device is portable and the stories shared can be books read aloud or anecdotes the storyteller wants to share. The device lights up for visual stimulation (StoryHome, 2016).
- *Bloom* is another venture underway for creating a closed, members-only network to provide safe, easy-to-use social interaction between family members, specifically between grandparents and grandchildren (Bloom, 2016).
- Studies show that Alzheimer patients are able to respond to caregivers when books are read aloud to them. The stories must have personal relevance. Also, patients often retain the ability to read for themselves through late, progressed stages of Alzheimer's (Freudenheim, 2010). As adoption of *Tele-Story* progresses, the user interaction scenarios can include reading stories for caregivers to play for family members living in memory care facilities.
- *CIRCA* (Computer Interactive Reminiscence and Conversation Aid) is a software company focused on developing software solutions for aid in therapeutic sessions for persons with Alzheimer's and other forms of dementia. *CIRCA* benefits are limited to caregiver-lead therapy sessions. A product similar to *Tele-Story*, but focused on the research described in the first bullet, could be used as a supplemental aid for independent therapy for *CIRCA* patients (Circa Connect Ltd., 2016).

An advanced technology that will be applicable to *Tele-Story* is hologram technology. Imagine having grandma there to read the stories and see her smile when she laughs. While we wait for that capability to become a reality, there is a fascinating technology involving holograms that I would love to incorporate into *Tele-Story*: Mid-air holograms that respond to human touch (Anderson, 2015). A recorded story that included these tiny holograms would be incredibly delightful. *Tele-Story* is the perfect application to pair with this exciting technology.

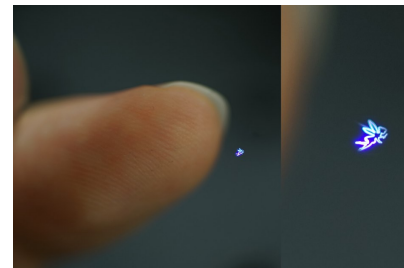


Figure 15. "Fairy Lights" 3D hologram

## Social Implications

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The use of technology to increase familial connections for family who are scattered around the world has many benefits; however, I am aware that I am adding another product to the heap of available applications for young children to use with their heads bowed and eyes on the screen. In a study on designing landscapes that promote childhood development, Sandra Wong points out that physical activity is essential to cognitive, social, and emotional development in young children, including infants. Instead of getting more time to explore physical space, young children are getting less during critical developmental stages (Wong, 2014).

*Diminishing outdoor play opportunities is aggravated by the commercialization of childhood play into packaged toysets and electronic learning gadgets which has an ever looming grasp over children's playtime and attention span. (Wong, 2014, p. 7)*

Benjamin Herold has written a blog article that backs up Wong's concerns and is even a bit more disturbing:

*Parent surveys administered by Eggleston and her colleagues also found that parents in the study expected their infants to be more independent when using tablets than when interacting with print materials.*

*That dynamic is troubling, the researchers wrote. Technology should be a "catalyst for play and learning together," they said, and parents should play with and talk about digital apps and e-books with their children in the same ways they do with print materials. (Herold, 2015)*

Wong, also, points out that the safety factor of kids using "electronic learning gadgets" is appealing to parents. However, now, those gadgets are not considered safe as parents worry they are portals to cyber-playgrounds where predators lurk. The explosion of social interconnectivity of the past decades has resulted in children being bullied via social networks to the point of suicide (Carter, 2013) and being victims of sexual predators (Whittaker & Bushman, 2009). The design solution to make *Tele-Story* both secure and easy-to-use results in a closed, members-only network. This security need interferes with the peer-to-peer sharing potential that I would have included in the design if I worked on this design just a few years ago. Peer-to-peer sharing is an essential element in building peer relationships and learning to cooperate in society (Satterfield, HCI 595x, 2013).



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