Happy Frame
Software Requirements Specification

Corben Roszak, Mikel Bresko, Anders Bergquist

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Introduction

Purpose

The opportunity here is that any family member (teenager, adult, or even senior) may want to stay connected with a loved one that lives in a nursing facility. Everyone knows that elderly folk keeps an abundance of photos as memories and daily distraction but now, with Happy Frame, their relatives can reach out and contribute to these memories with pictures of their own. For those that have loved ones in an assisted care facility who want to have a closer connection with their loved one the Happy Frame is a plug & play digital photo album that is simple to use and supports personal touches such as notes on a particular picture. Unlike other digital photo frames our product is simple to use and works on any HDMI compatible screen.

Document Conventions

WWU refers to Western Washington University
HDMI refers to High Definition Multimedia Interface which is the type of video cable we will be using to connect the device to a screen.
Raspberry Pi is the initial micro computer device being used for the Happy Frames physical device.

Intended Audience and Reading Suggestions

This project will first be released to a single resident who will be testing the device. We will get feedback from them and make design choices based on that. The app intended for the families of the resident, they will have total control of the device remotely. This project has been overseen by WWU professors Moushumi Sharmin and Aran Clauson and commissioned by Peter Stark.

Project Scope

In our first release of the Happy Frames device we hope to have all the barebone requirements covered. That is, having the capabilities to push photos to a remote cloud based storage system through some sort of mobile application, and then pulling from that storage system to the raspberry pi device. When the device is then plugged into a TV, we want the photos loaded on the raspberry pi to play in a slideshow fashion for the viewers pleasure. Some features such as having user accounts associated with each device we feel are necessary to include in the initial release, as without associated accounts it will be hard to structure where photos are being sent. The idea is to get all the fundamentals down for the device so that when we go in to showcase our product everything works as expected.

References

None at this time.

Overall Description

Product Perspective

The device itself is supposed to work as a storage unit for the 100 photos on it as well as a photo player when plugged into a TV or monitor. The Happy Frame will incorporate the features as simply as possible for ease of user. The application will be the tool operated by the user's family/friends. It should allow photo transfer with caption across the database into one or more connected Frames. The overall product will be packaged as a monthly subscription service to brighten the user's days.

Product Features

The main product features that the Happy Frame device will be implemented on the companion app. The device itself only has the slideshow and the splash screen feature. The physical device is a plug and play device which is a key feature of the Happy Frames device. The app will have user accounts, which can be added at will be any active user. Create an account feature to be used when a family member or app user first starts using the Happy Frames device. There is also the feature to add multiple Happy Frames devices per a single account from the app.

User Classes and Characteristics

There are two classes of users: The 'client' user (i.e. the person living in the nursing home who will view the photos) are expected to have limited knowledge of how devices and tech work, so the design must fit those needs. The 'uploader' user consists of the person buying the monthly subscription and any other connected people using the application and uploading photos.

Operating Environment

The Happy Frames device will plug into a screen in a resident's room in an assisted care facility. It will be powered via USB and be able to work on any HDMI compatible screen. The device will be WIFI enabled and store and display photos on the screen in a slideshow format. We will create an app for iOS/Android that will be used to send photos and other features. There will be a database which the app and device connect to to sync the photo library.

Design and Implementation Constraints

To simplify the building process for ourselves, we want to set some limits on what the Happy Frames device can do. The design is to have the device store up to 100 photos on its local drive, and play back photos at a fixed interval. This is subject to change and will be left open ended for future changes. The device will be set to update its photo storage once per

day, so we won't need to worry about constant streaming of photos. Our main device is constrained by Peter's wish to have no external buttons.

User Documentation

None at this time.

Assumptions and Dependencies

When deploying our device we are doing it under the assumption that there will be an adequate WiFi connection. Without a connection the device will not be able to update but will still continue to display the pictures that are on the devices local storage. We are assuming that the resident who will have the device in their room has a screen with an HDMI port. The Happy Frames device has no native screen and relies on some other TV or monitor to display photos on. We are also depending on the mobile app to have a user which connects to the device, if the user does not upload photos, no photos will be displayed. We are depending on the resident to be able to operate the TV to show the slideshow. While the slideshow is automatic, the TV must be on and functioning.

Features

Plug and Play

Description: Plug and play is one of the main features of our device, and is also one that separates it from similar products in the market. To make usability as simplistic as possible, we want the slideshow to start playing as soon as the HDMI cord is connected to a monitor.

Priority: 10. This is the start up routine which invokes the slideshow program and is fundamental to how the device will work.

Stimulus and Response: The audience in mind that we feel will most benefit from Happy Frames is the older generation, who might have little to no technological experience. By having the design of immediate start up we bypass the intermediate step of navigating to the slideshow. This avoids the frustration that comes with navigating unfamiliar user interfaces, which can prove challenging to understand.

Functional Requirements: On receiving a signal that the HDMI cord is plugged in, the device will startup its slideshow program. Unplugging the device resets and kills the program so when the device is plugged back in then the slideshow will start from the beginning.

User Accounts

Description: User Accounts establish the logical mapping of application to device. A user will create an account upon opening the Happy Frames Application, and add any number of Happy Frame Devices to that account. Each device will also have an admin account associated with it, who is essentially the one paying for the device. The admin will have the authority to add other accounts to the device by sending a device link to an unconnected account.

Priority: 10. Having user accounts is necessary to be able to link accounts to devices. We feel as this feature is an integral part of the project.

Stimulus and Response: A user on the application side needs to have a simple interface to easily navigate the available frames, and be in touch with the photos currently stored on the frames. Each account will display the other accounts associated with each frame, as well as what photos each person has uploaded. Groups of people who are associated with a shared device will enjoy being able to see what photos the other users have added.

Functional Requirements: The application will have the function to create and log into accounts, which will check and update the account database. Once a user is logged in, they will have the option to add frame devices to their account. Within each frame the user will be able to see what photos are currently stored on the device, as well as have the option

to add new photos to the frame. The admin account associated with a specific frame will be able to add other users to that frame.

Captions

Description: Captions add a personalized touch to any photo someone wants to share. Within the application interface a user will be able to see and select the photos stored in the database. After selecting a photo the user can then add a little blurb that will stay attached to the picture when it pops up in the slideshow.

Priority: 6. Captions are a feature we would like to implement, however they are not fundamental in making the device work.

Stimulus and Response: The target viewer of the Happy Frames Device will usually be someone who lives separately from their relatives and loved ones. Many of the viewers will be in retirement homes and could possibly have some sort of mental condition that impairs their memory. Captions are a way to explain to the viewer what is going on in the photo, making the viewer feel more connected with the people they love.

Functional Requirements: Within the Happy Frames Application senders connected to the frame will be able to see all the photos currently on the frames and all the photos they can upload to a frame. When selecting photos to upload the user will be able to add a caption in the text entry box below each photo to attach it to that photo. After finalizing photo updates the photos along with their respective captions will be pushed to the database, so when the device pulls them the captions will still be attached.

Splash Screen

Description: The splash screen is a start up feature we want to show up upon starting up the Happy Frames Device. A screen that shows many new photos have been added to the device will inform the viewer if their slideshow has changed. The lists of new photos will have the names of the people who uploaded the photos attached to them, so the viewer will know exactly who is adding photos to their device.

Priority: 7. A splash screen goes a long way in improving user experience. Not necessarily our top priority in terms of functionality.

Stimulus and Response: A title screen for the viewer that shows up immediately will be a nice introduction to the experience. Having a slideshow with a large number of photos on it may be overwhelming for a person especially if they can't remember which ones they've seen already. To combat this, we want the new photos that the splash screen acclaims to be shown first, to let the viewer know they aren't missing any new photos. People will be happy

to see all the new changes immediately so they aren't stressed out they missed anything.

Functional Requirements: The device will need to pull the splash screen from the database at the time it updates its local storage. The splash screen will be an accumulation of all the photo updates that were made between the time of the last sync. When a photo is updated, it should log the changes that were made and use this to make the splash screen.

External Interface Requirements

User Interfaces

Uploader users will be able to interact with the application linking to the Happy Frame device while the receiver users only view photos on the Frame.

Hardware Interfaces

There is only minimal to interact with on the device: on/off, and reset capabilities. It should be nothing more complex than plug & play.

Software Interfaces

Uploader users will be logging into and using the application to relay photos to the Frame device.

Communications Interfaces

The only 'communication' is the photo sending interaction coupled with the caption feature in the app.

Other Nonfunctional Requirements

Performance Requirements

The device needs to perform so little, and that's why a Raspberry Pi Zero will fit our needs. All it has to do performance-wise is play a slideshow of a hundred photos. We are expecting little cases where performance as it is traditionally recognized will be an issue. However, to function, the app must be connected to the internet or it cannot upload photos, even in a queue. Uploading the photos may depend on internet connection, but it should be fairly short time.

Safety Requirements

None.

Security Requirements

Authentication protocol is necessary to keep accounts safe, and password retrieval is needed to keep users in touch with their account. We will make sure that separate usages of the application will not create conflict with others

Software Quality Attributes

Since the code for Happy Frame needs so little to function, we expect a consistent usage with minimal possible errors. On the app side of things, we want to ensure that dragging/uploading photos does not feel buggy.