

PictShare Design Report

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Introduction (Project Charter):**Project Overview**

Our project is an hardware/software interface which uses a mobile application to send a picture to a server, which is then stored in a database. After the picture is stored in this database, it will be updated to a specific digital picture frame, replacing any prior image that is on the device. One frame can have multiple devices which send the pictures to it, but each frame will only store the most recent picture stored to the database.

Stakeholders

Potential stakeholders include a wide variety of people. We feel that our project would appeal to a range of customers, from college kids sharing pictures with their friends, to a grandmother who needs an easy way to be updated on what is going on with her family. We want it to be simple enough for anyone to plug in and use, and easy enough for more technologically savvy people with smart phones to have the wish to continue using it.

Framed Insights and Opportunities

There are many picture frame ideas like ours where multiple pictures can be uploaded to a place on the web and they are then pulled onto the frame to be displayed, but we wanted to simplify the process. Our idea was to have one picture show up at a time on a frame, and one that is uploaded solely from a mobile app. We feel that the limited storage price could potentially lower prices, making a relatively affordable picture frame that anyone could afford. We feel that this could make a potential competition among people to get their picture on the a particular frame, whether it be to siblings on their parents or a few friends on their house frame.

Need Statement: To provide a simple way for people to share mobile pictures in a way that can be simply displayed for an affordable price.

Project Goals and Objectives

The following section lays out our team's goals and objectives. If we are able to complete these then our project will be considered a success.

Goals:

- Create a complete working prototype that uploads mobile photos via an android app to a server, and then stores them on a database.
- Make a visually appealing mobile application.
- Bonus: Build a display/picture frame apparatus, like what we would use if the product were mass-produced.

Objectives:

- Create server, database, and mobile application
- Interface all with each other
- Make the application user friendly with wi-fi options able to be configured from the application rather than from the display.

Project Outcomes and Deliverables

The main deliverable of our project is a prototype display which will update upon adding a new picture to the server (for a specific user) and then place the picture on the display. For prototype purposes, our goal is to have a simple monitor which displays, which could be easily converted to a nice looking display for production.

The final outcome of this would be a complete, permanently running server, which stored various users and a single picture for each. Pictures would be added via a free android/iOS application, and then displayed on an affordable screen which would be produced in many sizes.

Project Duration

This section outlines the deadlines that we have set for ourselves to complete this project in a timely manner.

January 2013 - early February:

- Initial planning/debriefing on the project.
 - Decided on overall layout of the System

February - late March :

- Hardware selection
- Initial assembly/testing of hardware

March - end of May:

- Completion of interfacing/prototype application

May - June 13

- Completion of all prototype pieces and user manual

Team Mission and Team Objectives

This mission statement and list of team objectives will help guide our team to the successful completion of our project.

Mission Statement:

The mission of PictShare is to make a simple, affordable mobile to stationary picture display.

Team Objectives:

- To communicate with each other productively and efficiently
- Meet outside of class regularly
- Divide work evenly so everyone participates and is productive

Team Membership and Roles

Below are the members, and their designated roles, of the PictShare

- Josh Beeston - Back end work and mobile application development.
- Eddie Bell - Mobile application development and product research.

While each team member had their specific positions, if it was needed, we will collaborate to finish necessary tasks.

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Planning Information

The following products were some that we compared to to decided how we could make ourselves different:

- Impecca 17" Digital picture frame: \$199.95
 - We wanted to differ our product from this in price range (once the product is in production)
- Pandigital PAN8008DW Photo Mail Inch LED Digital Picture Frame Black
 - We decided to make our product work based on a mobile application rather than strict wi-fi in order for people to be able to update the pictures anytime and

anywhere.

Product Definition:

Introduction to Formal Product Definition:

Our final product will be a complete picture frame which syncs automatically with a permanent server which can be uploaded 24 hours a day with a picture from any phone who has the password and products number for the picture frame.

Marketing Requirements:

The marketing requirements we developed for the “PictShare” project were developed around the experience we wanted the user to have while using our product

1. Intuitive application layout
2. Plug in and use simple frame (internet options chosen via the application)

Engineering Requirements:

Here are a list of our engineering requirements with the respective marketing requirements that they cover.

| <i>Marketing Requirements # and (Engineering Requirements Category)</i> | <i>Engineering Requirements</i> | <i>Justification</i> |
|--|--|---|
| 1, 3 (Performance) | User submission of data will take less than a second (upload time). | Many users will have a negative experience if the product is slow. |
| 1, 3 (Performance) | Database search time will be less than 0.5 seconds. | Many users will have a negative experience if the product is slow. |
| 3 (Functionality) | The user will be able to input their picture in a streamlined | This picture is the backbone of what makes our product |

| | | |
|---|---|--|
| | fashion | |
| 1, 2 (Functionality) | The database results can be sorted by username | For simple the simplest database possible |
| 1 (Functionality) | One single picture will be uploaded at a time | Again, for simplicity |
| 2 (Functionality) | The displayed will take up the entire frame | For a clean looking product |
| 1 (Economic) | “PictShare” access will have no subscription fee. | Users prefer a solution that is open to the public and free of charge for its usage. |
| 1 (Economic) | “PictShare” will not have an upload limit. | Users will be able to upload whenever they feel like |
| (Energy) | Low power consumption from final picture frame | Should be relatively small based on only using a single display |
| 6 (Environmental) | An environmentally friendly product | Ties in with energy usage |
| 3, 4, 5 (Legal) | We will keep the database completely secure, so users will not feel that the product will compromise user photos | Users will only use the product if this is the case |
| 7 (Maintainability) | One hundred percent of files, classes, and methods will be commented. | Comments allow for the code to have an explanation in case someone in the future is ever attempting to maintain the existing code base. |
| 5, 7 (Operational) | Our team reserves the right to edit or delete data that has been entered into the database. | In case any information has been added that is deemed inappropriate, we reserve the right to remove it |
| 7 (Reliability and Availability) | There will be no more than 5 percent of downtime on the website at any given time. | Many users may depend on the product for up to date information, if the website is ever down it will not be for very long. |

| | | |
|--------------------------------|--|--|
| 5 (Social and Cultural) | We hope to spread the usage of the product via social media and word of mouth | We feel this is the best way to spread the product. |
| 1, 7 (Usability) | A maximum of three menus of depth for search results. | Makes the application as user friendly as possible |

Constraints:

This constraint has been put on our team by us as developers

- We have, as stated, constrained the product to one picture at a time

Design Criteria:

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This is the list of design criteria that we will use to evaluate our possible designs for our project:

- Query time (measured in seconds): The smaller the query time for our data base the better. We want the query time to be less than 2 seconds.
- Number Of Steps (measured in clicks): The number of steps or links the user has to follow before viewing or submitting data. The fewer the amount of steps the better. Our goal is 10 clicks for creating an account, and 5 clicks for uploading a new picture.
- Downtime (measured in percentage of seconds): The percentage of downtime vs. runtime of the website. The less amount of downtime the better.
- Code style (measured in comments per function): Code will be modular, easy to understand, and well documented. The more comments per functions the better.

User Experience:

Overview of the User Experience:

Simplicity is key for a product of this type.

Personas:

Name: Doris Grandma

Age: 78

Background: Doris is an older woman who wants a simple way to keep updated with what her grandchildren in college are up to.

Environment: Doris lives with her husband in a retirement community. They are a very active and functional couple, but not technologically savvy.

Skills: No technological background

Attitudes: An active woman who still keeps very close to her family.

Goals: Doris wants to stay as close to her family as possible, now that she has moved to her community in Florida.

Behavior patterns: Doris plays bingo on Tuesdays, and has a competitive nature

Blog entries:

1. “New photo arrived!”: 5/13/14

“I am so excited to see what my grandson Michael has been up to! He recently updated

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my frame with a new picture of him hiking Bishop’s Peak. He looks so excited with all his friends and I am so happy I get to see him so easily!”

Use-Cases:

The following are common use-cases that users of our product will be more than likely to experience. These short situations outline the details of interaction between the application, the user, and the database.

Data-submitting:

| Use-Case | Application |
|-------------|--|
| Actors | User number 1 |
| Description | Once installed and configured to a specific device, the user will be able to quickly send pictures to the desired frame. |
| Stimulus | User wants to input information to the database to quickly after be sent to the frame |
| Response | Application will immediately add the information to the frame. |

| Use-Case | Picture frame |
|-------------|--|
| Actors | User number 2 |
| Description | This user will have no actions to do other than view |

| | |
|-----------------|---|
| Stimulus | To keep updated on a friend or family member. |
| Response | The user will simply view the picture, maybe send a text of acknowledgment to the sender |

Design and Justification:

Overview of Team Process:

Our approach to this project is a very team oriented manner. Eddie took on the Android application, while Josh worked on the back end HTTP and FTP servers, and the MySQL Database.

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System Architecture:

_____ For our system, we had 4 main components: the Android application, the FTP server, the photo frame, and the MySQL Database. When the Android application created a new user, it inserts the new information into the database. When it takes a picture, it sends the picture to the FTP server. While this is all happening the photo frame, every minute, is polling the database for the username that corresponds with it's unique device id number, and then downloads the image from the server that corresponds with that username.

Systems Integration and Testing

Test Plan:

There is little testing for our product prototype, but we must be sure the picture uploads quickly regardless of wi-fi or 3G, and is then swiftly sent to the picture frame.

Results of Testing:

So far, all testing has been successful regardless of where the picture is uploaded.

Conclusion:

The future of the product is very much up in the air. We have a limited market strategy, but we feel that the prototype is functional enough to display all of the basic functionality we would want in a final product. We also feel that the product, if manufactured correctly for an affordable price, would be widely used by any age group.

Appendix**Budget request and Justification:**

HTTP Server and FTP Server are needed in order to hold the pictures.

We also need a MySQL database to hold all the information about the user accounts.

Bill of Materials:

Servers~ Free (as of the prototype, we would be willing to pay for a dedicated server option if the product design were to move forward).

Future Plans

Although so far we have been quite successful in what we have attempted, there are still some improvements that can be made for our system. As of right now we only have a 1st prototype version of our product, and we are considering taking the next steps to create an actual prototype frame. The app, while completely interfacing with all the hardware, is not at a visually appealing level to put out to the public. We also need to be more secure in our data transfer, as at the moment everything, including passwords, are sent to the server in plaintext, and our customers would not be happy about that.