The Cookie-Lickers

iDivvy Design Review

Final Project, Second Deliverable

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Introduction

Project Overview

Because our time here on Earth is short, humans have dubbed “time” a finite resource and aim to spend it in the best possible manner before death. Naturally, none of us wants to waste our precious time by doing chores like housework; but these chores still need to get done somehow, and that means fair distribution! The iDibbs Application System will provide a working, intuitive solution for college roommates in need of time and resource management and chore scheduling tools.

Project Goals

Our goal is to design and implement an intuitive, highly usable software-based chore distribution application. In order to meet this goal, we’ve broken it up into smaller sub-goals:

- Create an extremely fast, yet simple, interface to the system.
- Ensure optimal conditions for users to keep the system up to date.
- Surpass the shortcomings of traditional, casual roommate scheduling conversations and calendar marking.

Functional Highlights

Our iDivvy system will create, assign and store chore information inside the calendar. It will ideally function faster than the equivalent “shout to next door” method most roommates use to communicate (according to our research).

User Profile

Survey & Questionnaire

Because the success of our application relies heavily on the effectiveness of our user interface design, it is important that we receive constant useful feedback from target users during each phase of the development cycle. In addition to analyzing reactive feedback for working prototypes, we conducted preliminary interviews and used these results to steer the project's direction.

Process

Our method for generating useful feedback information can be broken down into three distinct parts:

1. We designed our user survey questions strategically to probe for answers to underlying development questions in a manner appropriate for the target audience (target user group). In addition, we precluded the survey with a 1-page demographic questionnaire.

2. We collected numerous survey responses using a variety of different methods (on-line, in person, over the phone, etc.) to minimize bias in the results. We also ensured our target user group comprised the majority of our user pool for a strong representation of the target group.

3. Finally, we determined if our survey results were conclusive or if we would need to re-evaluate our project direction and conduct additional testing. Once we were happy with the survey results, we separated our respondents into distinct "classes" and made useful comparisons and contrasts between them to extract typical "use cases".

Methods

Our survey was primarily done over the internet using an online survey system called SurveyMonkey[1]. In addition to our on-line surveys, our group conducted several face-to-face and phone interviews, yielding great success during our initial design phase. The on-line survey (see attached) consisted of 10 questions either multiple choice or short-answer, complete with an optional follow-up e-mail address question our group will use for prototype feedback in later development stages. For the initial iDibbs direction, our questions concentrated on getting information about housemate relationships (method of communication), their general logistical information, contact e-mail address, and their aptitude with electronic interfaces - particularly touch-screens.

[1] SurveyMonkey is a free on-line service for creating, proctoring and analyzing surveys: http://www.surveymonkey.com

Table 1: Survey & Questionnaire Methods

Method	Targeted Groups	No. of Respondents
iDibbs On-line (SurveyMonkey)	Students, Parents	25
Face-to-Face or Phone Interview (iDibbs)	Students, Parents, Children	4

Results

These are our preliminary results from our questionnaire and survey data:

Figure 1: Gender of Respondents

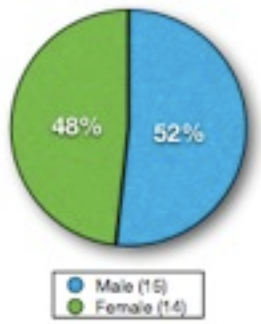

Figure 2: Computer Experience

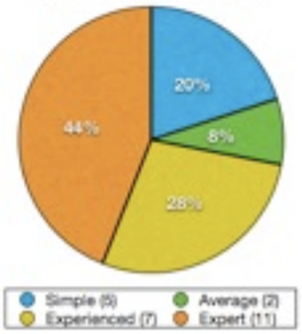

Figure 3: Used Touch-Screen?

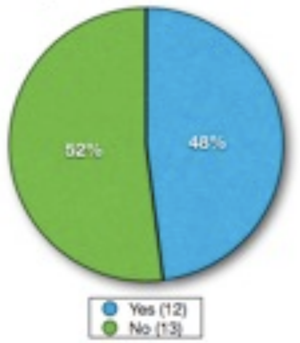

Table 2: Statistical Data from Survey & Questionnaire

Statistic	Min	Max	Mean
Age	12	51	22.058

Initial User Pool

Operating from information not only from the survey but from common sense, our most common user will be young adults of college age or post college young adults who share a residence for financial reasons. Our data would indicate, however, that the majority of our user demographic may not be inclined to use this product at all as 66% of those surveyed haven't ever reserved a shared item for use and only ~13% of those surveyed have agreed on a standing appointment for shared item use. What this told us was that our preliminary research (our first, informal round of surveys) may have been correct and that we needed to approach the product from a different angle.

Project Direction Shift

During our preliminary surveys we did gather some suggestions and ideas that chore management was an area that households consisting of roommates could benefit from a central scheduling device. Coming back to this idea now, we saw that an adaptation to scheduling tasks would not necessarily be vastly different from the target application we were tasked with so not all of our work would be lost. As family households commonly operate under a hierarchy with a central decision maker we still had solid reason to concentrate on the more fertile roommate demographic (which often lacks any one person to arbitrate these decisions) allowing us to retain most of our data gathered in the second, more formal survey round. Subsequent surveying will be held with follow-up questions regarding current practices for chore division of labor, turn-taking, and communication will be held to refocus our design on specific tasks with which the application could assist. Until that data is available, our previous surveys can still give us important insight into the user group to whom we're targeting the product.

User Summary

Our users are overall familiar with technology but not-necessarily fluent with complicated user interfaces. They are comfortable with the more common electronic user interface mental models (such as browser navigation, modal dialogs, social messaging, etc.). We've also made some assumptions about our users considering the scope and timeframe of the assignment: our users have no special accessibility problems concerning physical capability, they share a common cultural language (U.S./Canada), and our users are literate, speak English, and are able to communicate aptly using text.

Improving Upon Human-to-Human Communication

It's become obvious from the survey that the predominant form of communication between roommates is speech with 75% of respondents choosing it as their primary and preferred mode. Text messaging and email came in as distant second (12.5%) and third (8.3) place. Users preferred these methods because they were simple, fast, and had the least potential for misunderstanding. To be adopted and successful, iDivvy must be as easy or easier for roommates to communicate and reserve items via the application as communication via speech or simple text. Because of the very nature of a computer-based product like iDivvy, there may be aspects of our mode of task and chore scheduling that can trump direct communication:

- By having iDivvy preserve and store tasks and responsibilities. Users may find the simple feature of persistent storage of reservations or notes valuable enough since it alleviates the need to remember.
- Reminders can be sent one or more times before or the same day a task is scheduled to be done to all parties without the need for everyone to be in the same location. Since most respondents (70%) reported seeing their roommates less than three hours a day, this may be an obvious advantage of the system.
- We may be able to exploit and amplify is iDibbs' capability to provide communication between roommates that may rarely see each other by recording a scheduled chore within the house for later playback and/or sending the memo to via SMS or email.

The FridgeMeister itself may also provide a few physical advantages over human to human reservation and scheduling systems. By being in a (relatively) central, popular area (the refrigerator) and being hard-mounted and unmovable, the system is often in view and harder to lose or ignore.

Some users eschewed note or text-based communication because of the risk of misinterpretation (see comments of question 4). We can decrease some of the problems and anxiety involving misreading or misinterpretation of written messages by providing definite visual context. For example, the use of the calendar metaphor to communicate the time of a task not only places it in a common visual language but ensures that all information is present in the communication (eg. the date, the day of the week, the time span, and the chore description). These details can often be overlooked or misunderstood in note or speech communication because they lack the overview and context that metaphor can provide. The takeaway from our research is that in order to be adopted and used by even our tech-savvy demographic we'll need to severely limit the cost and effort required for data entry and accentuate all the benefits a computer-based chore system can provide.

Technology Exclusions

Voice would be preferred but may be unpractical for the assignment. If added, speech-to-text technology (and text-to-speech feedback) might be simulated by text entry/display.

The FridgeMeister

Distilling this information about past use and frustration with touch screens (from question 9) yields some early (and more importantly general) design points for the FridgeMeister:

- Buttons must be large and have definite feedback. In our case, the technology we have is lacking physical feedback, so audio and visual feedback must compensate.
- Navigation of the application must have clear presentation of reversibility to decrease anxiety over touch screen mistakes and errors.
- Tool tips and button feedback localized only around the pointer are largely unworkable (being covered by finger). Feedback and info must be around any finger-to-button contact area.
- Hover is largely unworkable as it is difficult and unreasonable to expect hand coordination equivalent to mouse pointer / button relationship. In other words, we can't expect the user to move their finger close enough to the screen to move the hover while controlling their hand enough to not accidentally touch the screen.

Task Profile

For our project we have decided to use the Object-Action Interface model because we believe it maps well with the object-oriented model that the Java programming language is based upon. In addition, the Object-Action interface matches the user's mental model for scheduling tasks using a using a scheduling system. To make our product competitive with other existing products/methods we plan to take advantage of the flexibility of computerized systems. Not only will our program be able to manage the scheduling of tasks and resources of multiple users across a network of shared devices but we will also be focusing on incorporating graphical depictions of key features and functionalities to improve on overall usability.

Task Domain

Our objective here is to establish a clear unified idea about what our mental model for this project is going to be. We want to map as closely as possible to any existing mental model that user would have pertaining to this domain. We feel that one of our challenges is to try to encompass things like appointments, tasks, and shared resources such as a vehicle or television into one category that would map well to a users mental model of these things. We hope further user testing will provide us with an effective solution.

Objects

Calendar

- Month view
- Week View
- Three Day View
- Single Day View

User

- User Profile view
- Edit User view
- Create User view

Chore

- Resource Select view
- Resource Edit View
- Resource Add View
- Resource Remove View

Actions

Calendar

Assign a chore to user

Mark a due-date for an already assigned chore

Revoke a chore assignment from user

Mark chore as complete

User

Select a person

Remove a person from the system

Add a new person to the system

Change a person’s details

Chore

Select a chore

Describe a new chore

Permanently remove an old chore

Functional Specifications

Schedule

Function	Description	Reason
View Task(s)	This is the main functionality of the schedule. The user is able to view scheduled tasks in different ways by indicating a timescale. The schedule displays all known tasks and which tasks are not finished yet.	Provides a concrete interface to scheduling the chores and it compensates for the lack of persistent state in verbal communication.
Create Task	The user requests that another person complete a chore, given a due date and an optional note.	Let's all the other users know when chores should be completed.
Remove Task	The user removes a selected event from the schedule. The task view enters a remove task mode and the user picks which task to remove from the view, when a selection is made, it is removed and the remove mode is exited.	Allows for scheduling to change as need. This is core functionality for managing chores.
Show tasks for User	The user can select a User from the User View and choose to view calendar for that particular user. The view will then show all the chores for the chosen user.	Allows people to view chores by user, core functionality for filtering out chores that are assigned to yourself.
Skip to Day	Allows the user to choose a day/week/year to view immediately. A user can enter a day manually and when finished the calendar will jump to display that day, staying within the current view.	Provides quick access to future or past schedules.

Users

Function	Description	Reason
Add User	This allows someone to assign a name to a picture of their choice. There are optional profile fields that the user can fill in. This information can be displayed in other places that are useful to the person reading the schedule.	Displays useful information to other users, and allows for easy lookup of a users schedule.
Select User	When an event is created the user designated to a chore should be selected. This will show the entire list of users and allow selecting with a simple click. This functionality is used primarily on the Add Event section.	Allows a user to be assigned to a chore and time.
Remove User	If a user will no longer be using the system, they can be removed. The person has to go into the manage section to remove a user and after verification they user will be removed.	Keeps only the necessary users.

Chores

Function	Description	Reason
Add Chore	Create a description of a chore and associate it with a picture for easy recognition. This is used to make a list of chores that can be assigned on multiple days and to multiple users.	Users should be able to easily create chores that can be assigned at will to a user and time.
Select Chore	Chores can be viewed and selected during the creation of the event. This will show a list of all the predefined chores, and an option to edit the list of chores on the fly.	Chores must be assigned to users during a time when an event is created. This is core functionality.
Remove Chore	If a chore no longer needs to be done or is no longer applicable to the living situation, it can be removed from the list of predefined chores.	Keeps the list of assignable chores to the minimum since it has the potential to get pretty long.

Implied Functionality

Function	Description	Reason
Text to Speech	The list of chores can be read off using a speaker connected to the computer or refrigerator. User information can be read by activating the speak command. Any confirmation dialog will be read if the dialog was activated as a result of a voice input.	The user doesn't have to be standing in front of the refrigerator reading a little screen to know what chores need to be done.
Voice Recognition	The user can speak a short list of commands that can interact with the system, for example, "Tell me the schedule for today" would instruct the computer to read off the schedule for the day. Or "add user" would initiate the add user dialog and wait for input to fill in the fields.	The user can be anywhere in the house and manage the schedule without having to be in front of a computer.
Facial Recognition	Detect the user and automatically skip to their schedule and read the list. When a user walks into a room where there are responsibilities the list of tasks would be read to the user over the room speakers.	The computer can interact with the person without having to select who they are from a list.

Performance Specifications

Schedule

Function	Experience Needed	Time to Complete
View Task(s)	The user must have a basic understanding of a calendar. The can navigate the calendar by using the interface to change what days are being displayed.	Clicking through days can take some time unless the "Skip To" option is used. On average < 10 seconds to find what they are looking for.
Create Task	Selecting users and chores is a matter of pairing them on in your head. The sorted and named list is easy to navigate, so a basic understanding of spelling is required. Selecting the date is similar to finding days on the calendar.	On average users were able to add an event in less than 30 seconds.
Remove Task	The user simply actives the "Remove Task" mode and selects which task to remove on the calendar view. Navigating to the appropriate day during the remove task mode may be needed, so the user would have to use their memory or pointing skills to access that day.	On average less than 10 seconds.
Skip to Day	The user must have a basic understanding of numbers, and date format. The day can be entered and the calendar will bring that day in to view.	Less than 10 seconds.

Users

Function	Experience Needed	Time to Complete
Add User	The user must have a basic understanding of a keyboard layout in order to use the onscreen keyboard to type in any optional fields. They can select an avatar or picture to represent the user being added; this is the only requirement of this functionality.	Less than 30 seconds. The user was able to select an avatar.
Select User	When adding a Task the user is require to select a person to designate the task to. This required them to make a selection from the list of users created using the Add User function.	Less than 3 seconds depending on their picture association skills.
Remove User	The user must go in to "Remove User" mode and make a selection for which user to remove.	Less than 5 seconds based on consideration.

Chores

Function	Experience Needed	Time to Complete
Add Chore	User must be able to pick a picture to represent the chore. Optional chore name can be added.	Less than 1 minute.
Select Chore	The user must be able to select a chore to assign to a person.	Less than 20 seconds.
Remove Chore	The user must put the chore list into "Remove Chore" mode and then click the chore to remove.	Less than 10 seconds.