PERSONAL MEDICAL DATABASE: IMPROVEMENT OF USABILITY

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Abstract

Today, with so many different kinds of medications, it is difficult enough for the elderly to remember when to take their medicine, let alone remember their doctor appointments and everything else associated with taking medications. The Personal Medical Database was created to address the problem that older adults have with managing their medications. Although the database schema has been established and the program is functional, we needed to improve the usability of the graphical user interface (GUI). We present the philosophy for the GUI, which is based on several user interface principles. We then show how following the philosophy makes the GUI more usable and efficient than the previous model. To test our claim, we also conducted an informal usability test. The results will show whether our implementation of the GUI was more usable than the previous implementation.

Introduction

It is not uncommon to find grandparents who are forgetful of what medications they are supposed to take or to when their appointments with their doctors are. Indeed, age can make it difficult to deal with health care. For this reason, the Personal Medical Database (PMDB) was designed to manage all the information associated with health care as well as remind the users of appointments and when to take medications. However, most of the elderly are not computer-literate. The easier the graphical user interface (GUI) is to use, the more likely the elderly are to use it.

In this paper, the goal is to make the PMDB more usable. Specifically, we will be establishing a philosophy on designing the GUI for the PMDB. Next, we will compare and show why the new GUI is more usable than the previous one. Additionally, we will restructure the PMDB so that it will be easier for future programmers to understand how the PMDB works. However, in order to prove that our new GUI is more usable, we will also need to conduct a usability test. Although we will establish the usability test, due to time constraints, we will only be able to test on a few individuals. By following the criteria from UI experts for designing on usable GUI, such a GUI will be easier to learn and more efficient to use by the elderly than the previous GUI, which did not follow those criteria.

Chapter I: Philosophy of the Personal Medical Database Design

       The philosophy of the design of the PMDB's GUI is to make it the interface usable; that is, it has an interface that is easy to learn and efficient to use.

       Before beginning, it is important to note that there are many different books that discuss common essential principles of designing a GUI. However, the focus of this paper will be only on a few key principles that are more relevant to the design of the PMDB. The major sources used are *User Interface Design for Programmers*, *The Essential Guide to User Interface Design*, and *GUI Bloopers: Don'ts and Do's for Software Developers and Web Designers*. Joel Spolsky, the author of *User Interface Design for Programmers*, is a software engineer who has worked on many products such as Microsoft Excel and hosts a web log targeted for writers for Windows software. The author of *The Essential Guide to User Interfaces Design*, Wilbert Galitz, has a B.A. in Psychology and has had a long career in human factors and user-interface design. Jeff Johnson, president of the usability-consulting firm UI Wizards, is the author of *GUI Bloopers: Don'ts and Do's for Software Developers and Web Designers*.

       The structure of this section is divided into two sections, one focused on ease of learning and the other on efficiency. Each paragraph introduces a design principle and shows how it helps make the user interface more usable, that is, whether it makes it more efficient to use or easier to learn. Then we will turn our focus on how a particular design principle improves the original PMDB by showing a general example. In order to make the GUI easy to learn, we will employ the principles of keeping the user interface natural, simple, and easy to navigate. For efficiency, we will focus on principles of consistency and proper usage of text.

Screenshot 1
The screen that pops up when trying to add a new observation (old model).

Ensuring that a user interface is natural reduces the amount of information the user has to learn before being able to use the PMDB. According to Jeff Johnson, for a user interface to be natural is to avoid having "steps users have to perform to get what they want that have no obvious connection to their goal" (Johnson 00, page 30). For example, in the old design of the PMDB, users can add an observation, which are the observed symptoms the person was afflicted with (see screenshot 1 above). An observation also includes the duration and the time of the symptom. When the user tries to create a new observation, however, the PMDB presents the user with the option to "edit" data and even allows him or her to save the observation. This can be seen in screenshot 1, where the word "edit" is on the label of both the symptom and date buttons. In other words, the user does not have the option to "state" or "add" a symptom observed, as he or she should be able to. It is hard to see how "editing" symptoms will help create a new observation. Therefore, the new PMDB avoids having such ambiguous options that may confuse the user.

Screenshot 2
The screen that's shown when the user is adding a new medication (old model).

Furthermore, a program will be easier to learn if it is simple; that is, "users should be able to get a lot without specifying much" (Johnson 00, page 37). For example, in the old model (see screenshot 2), the medication name must be typed in every time the user wishes to specify the medication name. However, it would be much simpler to have a list of medication names that the user entered before. This change may be minor, but it helps

to reduce the amount of information the user has to deal with. Too much detail can cause the user to be overwhelmed and confused (ibid., page 63). As a result, the new design of the PMDB seeks to hide as much detail as possible and tries to make it easy for the user to interpret the functions of each item.

Finally, having a good navigation scheme helps to prevent the user from getting annoyed (ibid., page 63). The new design orders the items from top-to-bottom and left-to-right (Galitz 118). Also, the first element in the order should be the most important (ibid., page 117). This is essential especially since one of the main functions of the PMDB is to add and edit new medications, locations, etc. According to Galitz, all research done on presentation have shown that the top-to-bottom, left-to-right scheme to be the best navigation scheme. If the scheme seems more intuitive, then the users will have less to remember and thus make it easier for them to learn how to use the PMDB. As a consequence of ease of learning, the users will be encouraged to use the program more often.
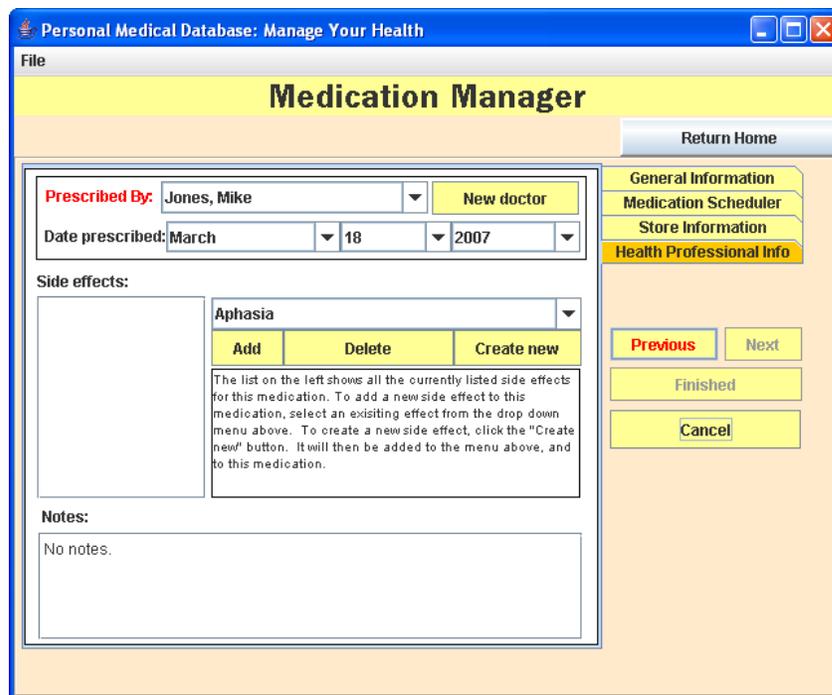
Screenshot 3
When adding a new panel, the user can browse through using the next button or by using the tabs (old model).

Even if the program is easy to learn, the users may be discouraged from using the program if it is slow and inefficient to use. One of the factors that may increase efficiency is consistency in design. Johnson points out that "users want to fall into unconscious habits as quickly as possible," and thus the more consistent the software is, the easier it is for them to do that (Johnson 00, page 42). Therefore, the layout design should be very similar between different modules. For example, Galitz discusses that button location is of great importance because a button can be "identified simply by its location without its label having to be read" (Galitz 02, page 410). In the previous model, all the "add new" buttons in the different modules were in different locations of the panel. However, if the

design sported the same look, then the user would be able to focus on their work rather than on finding the buttons that would help them do it. By this same idea, if one of the elements of the panel were inconsistent with the rest of the panel, it would emphasize its use (ibid., page 148). For example, in the previous design of the medication module, the button for removing a side effect from the list of possible side effects is three times the size of the add button. While it is possible that the user may accidentally select a side effect that is non-existent in the medication, they are more likely to add a side effect the remove it. Thus, it is more efficient to create a larger add button than a delete button.

Finally, since the PMDB handles a lot of textual information, it is preferable to have simple fonts with proportional spacing (Galitz 02, page 530). Using fancy fonts that are hard to read can make it difficult for users to locate the information they need, which leads to annoyance with the program (ibid., page 63). If using the program annoys the user, then it is possible for the user to simply abandon the program (ibid., page 64). Furthermore, the format of the text should be non-threatening and affirmative (ibid., page 521). Generally, it is more difficult for the user to understand a negative message such as "Do not press next until all the required entries have been filled out" as opposed to "Fill out the required entries before pressing next." As with consistency, if the user spends more time understanding the text than actually using the program, then it would defeat the purpose of the program. Creating an efficient program is as necessary as creating a program that is easy to learn.
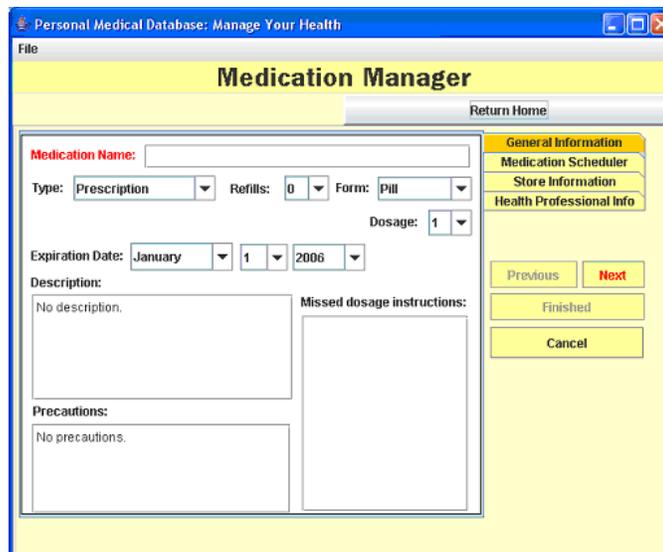
By following these design principles, the PMDB's users will be able to focus on the task rather than being blocked by their unfamiliarity with the program and the program's own inefficiency of getting the task done. Furthermore, if they find that it feels natural and effortless, then the program will have reached its goal of relieving the elderly of the worry of dealing with health care.

Chapter II: Design Considerations for the Medication Module

Although the philosophy has been established in the previous chapter, the current Personal Medical Database (PMDB) graphical user interface (GUI) does not completely conform to the PMDB philosophy. There are many different aspects to the design, specifically, the layout and the design of the layout, text, selection, and menu.

In the following pages, we will discuss how the Medication module has been redesigned to follow to be more usable, as discussed in the previous chapter. In particular, the paper will follow this format: first, we will identify a particular flaw in the original design and then propose a new design that seeks to improve those problems.

First, the positioning of the components of the screen, also known as the layout, is difficult to follow and understand because it lacks regularity and tabs are misused.

Screenshot 4
The screen when the user tries to add a new medication. The tabs, which are located on top right side of the screen, give the user a sense of orientation.

Tabs are used as a way of informing the user of where they are. However, the placement of the tabs is awkward. In screenshot 1, the tabs are placed on the right side of the screen. The usefulness of tabs comes from the fact that it is analogous to folder tabs in the real world (Galitz 02, page 477). To put the tabs on the right side of the panel would break that analogy and subsequently reduce their usefulness. Additionally, in the old layout, the tabs consume a large portion of the right side of the screen. The result is that the rest of the screen is cramped and difficult to read. Furthermore, it is difficult to read because it lacks regularity. Regularity, as defined by Galitz, is a uniformity of elements based on some principle or plan" (ibid., page 122). As can be seen from screenshot 4, the "dosage" drop-down selection box is in a row by itself, whereas every other row has at least two menus or textboxes of some kind. The more unordered it is, the more likely the user will choose not to put the effort into understanding it (ibid., page 119). In the old

model, casual observers may not notice the dosage menu as it located to the right of the screen. Since users prefer to read in a top-to-bottom, left-to-right order, they might not notice the dosage menu. In order to be consistent with the flow of items, the menu should be arranged in a predictable order. Without a good layout, it will be difficult to quickly locate the buttons and menus to complete a task.

To make the layout easier to follow and understand, we have designed a layout that uses the tabs properly and adds regularity to the model. In the new model, the tabs are removed completely. Although they might be helpful in telling the user where they are at the moment, they are most useful when they are used to present choices for a task (ibid., page 477). Furthermore, as real world tabs are not used as milestones of a single task, then neither should the tabs of this GUI. Thus, the tabs will be removed from the new model completely.

Secondly, the old model suffers from lack of regularity. The new model corrects this mistake by limiting to some degree the number of element in a row, thereby creating some order. For example, instead of placing "type," "refills," and "form" in the same row, the new model will place only "type" and "refills" in the first row. The cost of adding order is the decrease in space available. The simple solution is to simply add another panel that contains the information spilled from the previous panel. Finally, each text field/menu should be arranged so that every item in the same row has the same height, or at least does not take up space in the next row. This way, it will be easier to follow the screen and not miss out filling out important data. Once these additions are complete, the model will be less confusing and more ordered.

Screenshot 5

A portion of the screen when the user is trying to add a new side effect for a new medication (old model).

The second problem with the previous model is that there is too much text and it is difficult to read, particularly for older people. For example, in the main panel of the medication manager, the panel that displays the medication information is in Courier. Fonts with proportional spacing are generally preferred over fonts with non-proportional spacing, like Courier (ibid., page 530). Courier is not as legible as proportionally spaced fonts, like Times New Roman. Another problem to note is that even though few, instructions on how to use the PMDB are long and confusing. According to Joel Spolsky, "users don't read anything" (Spolsky 01, page 62). That is, most users tend not to read anything if it is not short. A prime example of this would be adding a side effect in the

PMDB. In screenshot 5, not only is the font of the text smaller than the rest of the text in the panel, but it is also decreasing the chances that the user will actually read it. Another example is lack of text. The old model highlights the "next" button (in screenshot 4) to indicate that there are still required fields to fill out. However, it never explains why it is red, which may confuse users who are not used to using the PMDB. Though most of the text is understandable, the few that are different can prevent the user from accomplishing their tasks.

To resolve these problems, the new GUI uses more readable text fonts and utilize shorter, concise instructions. We utilize Times New Roman because it features proportional spacing. An example of reducing the amount of text in the PMDB is to simply remove all the text. In particular, with adding new side effects, the change will be in the arrangement of the buttons rather than the text. This particular setup will be arranged such that the add and delete buttons will be between the two lists to indicate their function. If users do not like to read instructions and the program's goal is to be easy to use, then removing text is one solution. Also, to help the user understand which fields must be entered, if the user tries to proceed and presses next, the program will create a pop-up window that tells the user to fill out the listed fields. Hopefully, the change to a more readable font and the reduction of text will improve usability for the user.

Previous	Next
Finished	
Cancel	
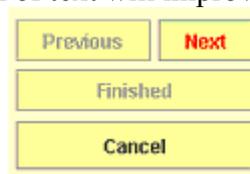
Screenshot 6

The navigation portion of the screen when adding a new medication (old model)

Another important aspect of the GUI that should be corrected is in the selection design. By increasing the size of a button, one would emphasize its use (Galitz 02, page 148). However, in this particular model the "previous" button is larger than the "next" button (see screenshot 6). In this case, it is not unreasonable to believe that the "next" button will be used more often than the "previous" button. Additionally, there is an additional "finished" button that is never used until the user is done entering all necessary information. According to Johnson, the software should minimize the need for the user to figure out how the software works (Johnson 00, page 38). Because the finish button is larger than either the "previous" or "next" buttons, it may confuse the user as it indicates that there is a greater emphasis on its use.

By following the philosophy, the solution to these problems are to simplify the design of the buttons as outlined in the philosophy and to follow to the navigation scheme. Since "next" is used more often than "previous," it would seem better to create a larger "next" button. However, as there are relatively few buttons on the screen (compared to programs such as Microsoft Word), it may conflict with the aforementioned regularity of the screen. Therefore, the better solution is to change the buttons so that both are of the same size. Regarding the "finish" button, it would be better to remove the button completely and change the label of the button to "finish" on the last screen, which will be a summary of all the information the user entered. We hope that the user will understand that the

summary screen will signify to the user that it is at the end of adding a new medication. This way, the user will understand that they are finishing up and will not see the label until then. Furthermore, in order to preserve the order in which the items are presented in the GUI, the buttons are placed at the bottom of the screen. It has been shown in studies that users generally prefer that the final buttons to be at the bottom of the screen (Galitz 02, page 410-411).

Finally, menus are commonly misused, making it difficult for the user to efficiently complete the task of filling out a new medication.

Screenshot 7

The drop-down menu for duration when adding a new medication (old model).

For example, in screenshot 7, the program uses a drop-down selection box for specifying the number days. However, one disadvantage to using that particular menu is that the list may be ordered in a confusing way, making it hard to find the desired item, as seen in screenshot 4 (ibid., page 471). In the screenshot, the list is very long and thus makes it difficult to find the number of days. If a menu is used for the wrong context, then it will only make the user interface more difficult to use.

As drop-down menus are not well suited for containing a list of numbers, it would be better to add a spin box instead. A spin box is a menu that allows the user to increment and decrement the given value and even let them type it themselves. This would make it easier to enter the information that the user desires. This agrees with keeping the screen consistent and the navigation scheme.

The new design eliminates a lot of the potential problems that the users may face with the initial GUI. It tries to accomplish the goal of being easy and efficient to use by cohering to simplicity and consistency. There is no guarantee that this design will be very usable until the users test it; however, it is less likely to have as many errors as the original design as it follows on general principles written by design experts. If the design is good, then the users will be more likely to use it and the PMDB will be able to serve its purpose**.**

Chapter III: PMDB Structure

In the previous model of the PMDB, the structure was arranged so that each module's components are separated into their own packages. For example, the model, view, controllers, and database access objects of the medication module were stored in a package called meds. Additionally, all the corresponding UML models were stored in the same package. Generally, the files followed a convention where the suffix of the filename describes whether it is a view or not, such as `HealthProfessionalPanel`. However, there were some classes that did not follow these conventions, such as `GUI` in `meds`, which should have been--according to the convention adopted—`MedicationPanel`.

Furthermore, there were many javadoc packages. The packages `doc` and `doc.automata`, and `doc.resources` were used for the automata package. Other packages like `main.docs`, `main.docs.main`, and `main.docs.resources` hold the javadocs of the main package files.

The `automata` package contains files that prevent opening another instance of the Personal Medical Database. Other than that, there did not seem to be much use for the files.

The `healthpro` package contains `WorkPlace` and `HealthProSpecialty`, both of which are data classes are used to store data for the other classes in the package.

The `location` package contains the same: a `LocationAddPanel`, `LocationaEditPanel`, `LocationDAO`, etc.

The most inconsistent module is the `main` package, where the rest of the collection of java files are put together. Essentially, it contains the files needed to start up the project. The file that has a main is `PersonalMedicalDatabase`. One file that seems to have nothing to do with the startup is the `UnitComboBox`, which the `Observation` module to depends on. Also, there is an `InitializeAutomata` class that no file depends on. Additionally, in the main module, there are three files with the prefix Log. Essentially, they function together as a method for printing out error messages. The advantages of printing out accordingly is still unclear. In the main package, there is the `PMDPanelInterface` that all `PMDBPanel`'s implement so that the `PMDBMain` can switch between the panels and use the implemented functions. There is also a `PMDBPanelType` whose pattern is type-safe enumeration and whose purpose seems to be to act as a way to specify whether the editing panel is editing or adding an element. However, the only class that uses it is the `HPMainVisit` and `HPVisitVis` in the visits package.

In the `util` package, it holds the `STDatabase`, which is the class that connects with the database and retrieves information about `HealthProfessionalVisits`. It also contains the `Splash` class, which is used to create the splash screen at startup.

The `visits` package does not quite follow the general naming convention, but all its classes seem to be needed only in the package itself.

List of Java Files in the PMDB Package

automata
  Automaton
  DuplicateHasStatusCheckException
  DuplicateStateNameException
  DuplicateTransitionException
  NoSuchTransitionException
  NotFinalStateException
  ReminderClicked
  State
  ToDoModule
  Transition
healthpro
  HealthProDAO
  HealthProDBManager
  HealthProfessional
  HealthProfessionalAddPanel
  HealthProfessionalEditorPanelvis
  HealthProfessionalEditPanel
  HealthProfessionalPanel
  HealthProfessionalPanelvis
  HealthProSpecialty
  HealthProWorkPlace
  Specialty
location
  Location
  LocationAddPanel
  LocationDAO
  LocationEditorPanel
  LocationPanel
main
  HealthProDBManager
  InitializeAutomata
  LogDepth
  LogMsg
  LogSetting
  MainPanel
  MedInstaller
  PersonalMedicalDatabase
  PmdMainFrameVis
  PMDBMainVis
  PMDPanelInterface
  PMDPanelType
  SQLKeys
  STPMDSQLKeys
  UnitComboBox
meds
  Doctor
  EditableItem
  GUI
  Location
  MedController
  Medication
  MedicationEditPanel
  MedicationInfoPanel

MedReminderAction
NewMedicationPanel
PersonalMedication
observation
  Observation
  ObservationEditorPanel
  ObservationInfoModel
  ObservationPanel
patient
  AddPatientvis
  DBInterface
  LoggedInUser
  LoginPanelVis
  MonthsOfTheYear
  PatientEntry
  PatientMainVis
  PatientModel
  UpdatePatientVis
util
  DatabaseInterface
  Splash
  STDatabase
visits
  CalendarVis
  DBInterface
  EntryFoundException
  HealthProfessionalProcedure
  HealthProfessionalVisit
  HealthProfessionalVisitPanel
  HealthPRoVisitNew
  HPProceduresListPanel
  HPProceduresNew
  HPvHealthProfessionalEntry
  HPVisitEntry
  HPVisitVis
  HPVMainVis
  HPVModel
  HPVModelInterface
  HPVPatientEntry
  HPVProcedureEntry
  HPVProcedureRecordsVis
  HPVProcedureVis
  JCalendar
  Patient
  ReminderClicked
  VisitHandler
  VisitHealthProfessional

Chapter IV: PMDB Redesign

Although the previous version of the PMDB model is fairly organized, there are quite a few inconsistencies and anomalies that could be fixed to make it a more coherent model. This includes consistent naming conventions and having relevant classes contained in the same package.

Generally, it would be better that the whole model go through a renaming process so that future users will be able to understand the basic function of each individual file without having to look at the source code. Some files that would require renaming would be something like the `GUI` file in `meds`, which is merely the main panel for the `Medications` panel. Others would be clean up the files that end with `PanelVis` and change that to `Panel`—the panels that ended with `PanelVis` were named because it was the newer version of the original panel files.

In general, the main package is the most difficult package to understand, mainly because of the large amount of classes whose function is difficult to decipher by merely reading its name. For example, there are several classes like this, but most glaringly obvious is the `InitializeAutomata`, which seems to conflict with the `PersonalMedicalDatabase` file (which contains a main method). The function of `InitializeAutomata` does not seem to be necessary to the execution of the program or even any other classes for that matter. It would be better to put the file under the package of `automata` since it affects nothing in the main package and seems to deal with the rest of the automata components. A similar case would be that of the `UnitComboBox`. Although it is located in the `main` package, it is not used by any of the `main` package files; instead, only one class in the `Observation` package needs it. It seems that the author of the file deemed it to be useful for other future classes; regardless, its place should not be in the `main` package. If it does not in the `observation` package—since it is the only package that uses it—then it should be in the `util` package.

However, the `util` package itself does not seem necessary. The only files that are in it are `STDatabase` and `Splash`. `STDatabase` is a class that manages the `HealthProfessionalVisits` by retrieving it from the database and saving it to the database. It stands to reason then that it should be placed under the `visits` package. Furthermore, `Splash` is the splash screen; it should then logically be placed under main. Had there been more classes that were needed by all the packages, then the `util` package may have served some purpose, but the current state seems to lack any file that is not class specific. Removing the `util` package would be the best option.

As the current model is arranged in straightforward manner, the restructuring of the model is certainly not crucial; however, if the files that are misplaced and whose function is vague are restructured, then it could save future programmers of the PMDB hours of time spent on understanding the PMDB model.

Chapter V: Usability Testing

I. Research Question:
How can the Personal Medical Database be made easier to use for its users?

II. Hypothesis:
The PMDB can be made more usable by improving the usability of the GUI. Users of all categories will find the PMDB with the new GUI, which follows fundamental GUI principles, easier to use than the old GUI, which does not. Specifically, the number of mistakes, the time it took to complete the task, and the number of questions for users will be significantly lower for those that used the new GUI as opposed to the old one.

III. Specific Aim
Conduct a rigorous case study that will evaluate the usability of the new GUI compared to the old one. The users who use the newer model will generally ask less questions and add/edit medications faster.

IV. Sources of Evidence
1. Interviews (structured)
2. Direct Observation (note taking)

V. Variables
  A. Independent
      a. Age of the user (elderly/young)
      b. Order of which PMDB model to use first (new-old/old-new).
      c. Person's familiarity with computers (familiar/unfamiliar)
          i. On average, how long he/she uses a computer per day (hours per day)
          ii. On average, how long has he/she been using a computer (months/years)
      d. State of person (active/tired)
          i. On average, hours of sleep per day
      e. Gender (male/female)
  B. Dependent
      b. Number of questions asked
          a. How to execute a specific task, like add a side effect.
          b. What a particular field is for.
      c. Time taken to complete the task (minutes).
          a. Per medication to add
          b. Per medication to edit
          c. Total time to add all medications
          d. Total time to edit all medications
          e. Time to add and edit all medications
      d. Number of mistakes using Medication Manager
          i. Adding side effects to the wrong pane.
          ii. Not changing/adding a value of a field.

VI. Categories

Age:

65 or older is considered elderly. In the United States, this is typically considered the old age because this is when citizens can receive social security benefits. Furthermore, one of the requirements for eligibility for Medicare and Medicaid is to be 65 years or older. As many common senior diseases (e.g. memory loss, eye diseases) are more likely to be present in people over 60, 65 years of age is a suitable age to define an elderly person for this study.

As 50 years of age is considered old enough to be in the AARP (American Association of Retired Persons), any age below 50 is considered young in this study.

Order:

The order is defined as the order that each user will try using first. For example, in group A, the users will try the old GUI first and then the new GUI and vice versa for group B. The reasoning is that although the interface has changed, the users will still be entering the same data and will know what to expect, which may skew the amount of time they take to complete the given tasks.

Gender:

Determines whether the user is a male or a female.

Familiarity:

Familiarity with computers means that users are familiar with programs such as Microsoft Word and Internet Explorer and are able to use them for typing essays and browsing the Internet, respectively. While it is sufficient for someone who can write in Java to be considered familiar, it is certainly not necessary. A person's familiarity with computers will be established with a questionnaire provided. If a person scores 6 or above, he or she is considered familiar. If the person scores 5 or below, he or she is considered unfamiliar with computers.

Number of Questions Asked:

As the name implies, this category is concerned with the number of times the users has to ask a question on how to use the interface. The more the questions asked, the less effective the GUI is. It effectively measures how easy it is for the user to learn.

Time:

This variable keeps track of how long the user takes to complete the entire task. Time will be recorded in terms of minutes and seconds. The faster the user can complete the task will measure how effective it is to use the GUI.

Number of Mistakes:

This variable keeps track of the number of mistakes the users make while using the interface. Mistakes are wrong inputs that are a result of the GUI rather than a misunderstanding of the medication. For example, if nausea is a side effect of a particular medication, and the user leaves this side effect in the *side effect menu* box rather than *side effect* box then it counts as a mistake. Mistakes are only counted if the user fails to correct the mistake before saving the data (pressing the *finish* button on the GUI).

VII. Unaccounted factors
1. There is a large range in terms of age. Elderly could be 65 or 100 years of age, and this difference may impact how well they can use the PMDB.
2. The list of medications may not contain the same information as a real medication given by a doctor.
3. Time of day.
4. The state of mind of a person is important in how many questions he or she asks and how long it takes for him or her to finish the task. The variable of activeness is, however, difficult to measure.

VIII.   Measuring Usability
Usability = number of question asked + time to complete + number of mistakes

Old GUI

	Questions (average)	Time (average)	Mistakes (average)	Usability
Old (>= 65)				
Young (<= 50)				
Order: new-old				
Order: old-new				
Familiar				
Unfamiliar				
Male				
Female				

New GUI

	Questions (average)	Time (average)	Mistakes (average)	Usability
Old (>= 65)				
Young (< 65)				
Order: new-old				
Order: old-new				
Familiar				
Unfamiliar				
Male				
Female				

There are 8 different possible combinations, so we will use a sample size that is a multiple of 8, namely 24. This way, we will have at 3 of every possible kind of combination.

IX. Overview
1. Select a group that is divided into the different categories stated above (e.g., elderly, etc.). to try the new and old PMDB models.
2. The group will consist of 24 people.
3. They will be not told what the PMDB is and what the survey's goal is.
4. There will be two equal groups: group A and B.
5. Group A will use the old model first and then try the new model.
6. Group B will use the new model first and then try the old model.
7. Each group will be asked to add 4 medications, each medication having slightly different attributes.
8. Each group will be asked to edit the 4 medications.

X. Procedure (for each person)
1. The user will be asked to take the questionnaire.
2. Start the audio recorder to record their comments on the PMDB.
3. The tester will erase the database and replace it with a default set of data.
4. The tester will start up the program of the new or old GUI, depending on which group the user is in.
5. The user will be asked to add a list of medications.
6. The tester will begin recording the time.
7. The tester will not give instructions on how to use the PMDB unless the user is confused and cannot seem to use it. This will be noted in the transcripts.
8. The tester will be taking notes on the user's reactions and mistakes.
9. After adding all the medications, give the user the list of medications to edit.
10. After editing the medications, the user will be asked to do the same thing with the other model.
11. Repeat steps 3 to 9 for the second GUI.
12. Once the user is done, the tester will ask him/her a list of usability questions.

Note: the answers in **bold** are the correct answers

Familiarity Questionnaire:

Circle one of the following 1 of the four choices.

1. What program would you use to access the web page www.google.com?
   a) **a web browser**
   b) a spreadsheet
   c) a word processor
   d) a media player

2. What program would you use to create a research paper?
   a) a spreadsheet
   b) **a word processor**
   c) a web browser
   b) a media player

3. What best describes receiving information from the Internet?
   a) uploading
   b) getting
   c) **downloading**
   d) transferring

4. Which device is best used to transfer a file from one computer to another computer?
   a) **a floppy disk or USB flash drive.**
   b) a mouse
   c) a headphone
   d) a hard drive

5. How would you usually turn on a computer?
   a) turn the monitor on
   b) **press the power button on a computer**
   c) nothing; it will turn itself on when you are ready
   d) press the escape button

6. What is the most common problem when you try to print a document?
   a) the printer prints in a different color
   b) the printer prints a black page
   c) **the printer has a paper jam**
   d) the printer shuts itself off

7. When someone says that your computer is full, what does it usually mean?
   a) **that your hard drive space has almost been used up**
   b) that your computer has too many devices attached to it
   c) that your computer has too many application open at once
   d) that you have too many objects sitting on top of your computer

8. How would you usually close an application?
   a) **press the x or red button on the top right side of the screen**
   b) press the power button on your computer
   c) press the delete key on the keyboard
   d) press the escape button on the keyboard

9. How do you delete a file?
   a) select the file and type "erase"
   b) shut down your computer
   c) select the file and hit the escape button
   d) **drag the file into the recycle bin or trash can**
10. Moving text or pictures from one document to another is commonly called what?
    a) save and transfer
    b) **copy and paste**
    c) backup
    d) create duplicate

Medications to Add

1.   Name: Tylenol
   - Expiration Date: April 2, 2007
   - Form: Pill
   - Dosage: 1
   - Type: Prescription
   - Refills: 0
   - Prescribed by: Jones, Michael
   - Date Prescribed: November 1, 2006
   - Purchased at: Pills 'N More
   - Initial Amount: 100
   - Duration: 1 days
   -   1 pills per day
   - Side Effects: Exhaustion
   - Times: 8:00 am
   - Description: Relieves pain and reduces fever.
   - Precautions: Overdoses can be fatal.
   - Missed: Do not take more than prescribed per unit of time.
   - Reason: Suffering from chronic headaches.
   - Notes: No notes.

2.   Name: Diuril
   - Expiration Date: August 5, 2007
   - Form: Pill
   - Dosage: 1
   - Type: Prescription
   - Refills: 0
   - Prescribed by: Jackson, David
   - Date Prescribed: February 7, 2007
   - Purchased at: Modern Medicine
   - Initial Amount: 100
   - Duration: 6 months
   -   2 pills per day
   - Side Effects: Dizziness
   -   Headache
   -   Nausea
   -   Vomiting
   -   Excess urine production
   -   Dehydration
   -   Hypoelectrolytemia
   - Times: 8:00 am
   -   5:00 pm
   - Description: Used to manage excess fluid.
   - Precautions: No precautions.
   - Missed: No missed dosage instructions.
   - Reason: Congestive heart failure.
   - Notes: No notes.

3. Name: Vasotec
   Expiration Date: April 2, 2007
   Form: Pill
   Dosage: 1
   Type: Prescription
   Refills: 3
   Prescribed by: Howard, Steinback
   Date Prescribed: September 3, 2006
   Purchased at: Pills 'N More
   Initial Amount: 20
   Duration: 15 weeks
                        2 pills per day
   Side Effects: Sudden Faintness
                        Headache
                        Depression
   Times: 9:00 am
                        4:00 pm
   Description: Used in the treatment of hypertension.
   Precautions: No precautions.
   Missed: No missed dosage instructions.
   Reason: Chronic heart failure.
   Notes: No notes.

4. Name: Salbutamol
   Expiration Date: April 2, 2007
   Form: Liquid
   Dosage: 5 oz
   Type: Over-the-counter
   Refills: 0
   Purchased at: Modern Medicine
   Initial Amount: 100
   Duration: 1 days
                        3 pills per day
   Side Effects: Dizziness
   Times: 12:00 pm
                        1:00 pm
                        4:00 pm
   Description: Used for the relief of asthma.
   Precautions: No precautions.
   Missed: No missed dosage instructions.
   Reason: No reason.
   Notes: No notes.

Medications to Edit

1. Medication: Diuril
   a. Change refills to 10.
2. Medication: Tylenol
   a. Change name to Advil.
3. Medication: Vasotec
   a. Remove Faintness and Depression from side effects and replace with Exhaustion and Hypoeletrolytemia.
4. Medication: Salbutamol
   a. Remove 12:00 from the list and add 10:00 am.

Interview Questions

Circle one of the 5 given choices.

1. How useful were the tabs that were in the first model in keeping track of where you were?
   1 = was confusing
   2 = slightly confusing
   3 = no difference
   4 = somewhat useful
   5 = was very useful

2. How much easier was it to focus on the task in the second model?
   1 = much more difficult
   2 = slightly more difficult
   3 = no difference
   4 = somewhat easier
   5 = much easier

3. How useful was the summary page in the second model?
   1 = very confusing
   2 = somewhat confusing
   3 = no difference
   4 = somewhat useful
   5 = very useful

4. How easy was it to add side effects in the second model compared to the first model?
   1 = very difficult
   2 = somewhat difficult
   3 = no difference
   4 = somewhat easier
   5 = much easier

A drop-down selection box:

```
┌──────┬───┐
│ 21   │ ▼ │
└──────┴───┘
┌──────┬───┐
│ 21   │ ▲ │
│ 22   │   │
│ 23   │   │
│ 24   │   │
│ 25   │   │
│ 26   │ ▤ │
│ 27   │   │
│ 28   │ ▼ │
└──────┴───┘
┌──────┬───┐
│ 21   │ ▲ │
│      │ ▼ │
└──────┴───┘
```

A spinner:

5. How useful were the spinners for day and year (compared with drop-down selection box)?

    1 = very unintuitive
    2 = slightly unintuitive
    3 = no difference
    4 = somewhat useful
    5 = very useful

Chapter VI: Implementation of Medication Module

First, before implementing the module, a specific design had to be created. The results are in appendix A, and they follow the principles outlined in chapter 1 and took into considerations more specific issues that needed to be fixed as stated in chapter 2.

In order to implement the new PMDB module outlined in the drawings (see appendix A), the GridBagLayout from Java's API was used. The choice for using GridBagLayout was because it offered more dynamic and maneuverable components. It retains the easy specification of location of Java's GridLayout and gives almost as much freedom of size and placement as null layout. Furthermore, if there are any minor changes that need to be done in the future, GridBagLayout makes it very easy to change the placement of any individual component.

Finally, in order to provide two different GUI interfaces, the new GUI was created on a separate package, named meds2. When the program is given a command line argument of either 0 or 1, it displays the corresponding GUI for medications.

Chapter VII: Results and Analysis of Usability Testing

I. Data Results

Subject 1: Aliya Ma Lynn

Note: Unfortunately, subject 1 was unable to finish the usability test, having spent nearly 2 hours and getting exhausted on the usability test. As a result, the data is incomplete: she did not finish adding the last 2 medications and was not able to edit the last two. Nevertheless, we still show the data in hopes that future researchers will still be able to use this data and perhaps find out why the GUI was so difficult for her to work with.

Category:

Old/Young	New-Old/Old-New	Familiar/Unfamiliar	Male/Female
Old	Old-New	Familiar	Female

Usability:

Old GUI

Questions	Time	Mistakes	Usability
20	90	19	129

New GUI

Questions	Time	Mistakes	Usability
6	31	7	44

Subject 2: Ameer Ayoub

Category:

Old/Young	New-Old/Old-New	Familiar/Unfamiliar	Male/Female
Young	New-Old	Familiar	Male

Usability:

Old GUI

Questions	Time	Mistakes	Usability
0	11	4	15

New GUI

Questions	Time	Mistakes	Usability
0	16	3	19

II. Data Analysis

In this data analysis, we analyze why subject 1 was confused on what she was doing and with how the GUI works and possible reasons of why she spent such a long time on the test. For subject two, we analyze why he had a lower usability score for the old GUI model. Finally, we look at why it seems that the users spend more time in general on the first GUI that they are presented with.

As the data for subject 1 is incomplete, a complete analysis cannot be done. However, it should be noted that subject 1 did not completely understand what the task was even it was explained several times. Although technically considered familiar (by the familiarity questionnaire), the author considers subject 1 a user that is not a computer-savvy user based on the subject's actions in the usability test (see Future Improvements). Thus, unsurprisingly, subject 1 spent more time on the usability test than subject 2.

As previously stated, subject 1 was not very clear on how the GUI components worked. For example, when finished with a page, she continuously asked whether it was over (appendix B). She asked what she was supposed to do next rather than ask how to proceed and add the rest of the information (appendix B). This and many other mistakes like it leads one to believe that she was fairly confused on how the GUI components and also contributed to the time she spent on the test.

Another possible reason that subject 1 spent a long time adding and editing medications is because of reduced motor skills. Several times during the test, the subject repeatedly tried to add information (like selecting an item from a drop-down box) and continuously failed (see appendix B).

Subject 2 had a lower usability score for the old GUI than the new GUI. One possible reason is that the subject spent more time learning how to use the GUI and the medications. Furthermore, the subject used the new GUI's summary page to compare the information on the GUI with the information on his sheet.

Subject 2 made 1 more mistake in the old GUI than the new GUI. Most of the mistakes came from working with the side effects interface. In fact, this was the only section subject 2 had made a mistake with both GUIs (that was due to the GUI). Other mistakes were misreading the information on the sheet, like adding 1:00 am as a time rather than the correct time of 10:00 am (see appendix C). Considering that he made no mistakes with the other components, that he used the new GUI first, and that all other mistakes was due to misreading information, this can be seen as evidence of improvement over the original GUI.

Finally, it seems that in general, there is a substantial amount of time spent learning how to add a medication. However, this seems to be more of the fact that the user spends time reading the sheet and trying to pair up the data on the sheet with the information displayed on the computer screen. The reason for this conclusion is that the subjects tended to forget to add certain information or had questions on where to add a piece of information (see appendix C). This was because the information listed on their medications sheets did not list the information in the same exact order as either GUI.

Chapter VIII: Future Improvements

Based on the data presented, there should be a general revision of the usability test and the new GUI.

It should be noted that the author intended to have a user who was unfamiliar with computers. Surprisingly, subject 1 scored well enough on the familiarity questionnaire to be considered familiar. However, it is noted that she had trouble understanding how the GUI worked on how different GUI components worked in general. It seems that the familiarity questionnaire should be changed to a GUI Familiarity questionnaire. That is, the questions should ask the user some basic computer questions (e.g. how to delete a file) as well as GUI-specific questions.

Also, what was the cause of several mistakes was the fact that the sheet of medications had a font size of 10. This was a cause of frustration for subject 1, who constantly could not find the information she was looking for. For future use, it would probably be better to put each medication on a single page in a size 14 font.

Another error in the usability test's design that was not noted was in the editing of medications. If the user failed to add a medication, as subject 1 did, then he or she cannot edit that same medication. The test should have the user to edit medications that are not added by the user.

Subject 2 noted that the tabs were very useful, particularly when editing medications. Although subject 1 noted that the tabs were confusing in the interview questions, as she never used them are seemed to notice them, it can be safely assumed that she did not understand what tabs are. The new GUI can be improved with the addition of tabs, for the benefits of giving the user a sense of orientation outweighs the disadvantage of misleading the user that the user must fill out all the tabbed pages.

As the sample size of this particular test is miniscule, there was little information that could be derived from what parts of the GUI were useful and not useful. However, based on the users' reactions, there is definitely a need to revise the usability test.

Chapter IX: Conclusion

Due to the limitation of the small sample size, it is hard to conclude with any concrete evidence; however, the new GUI does show promise of being more usable. Since subject 1 was very confused and could not finish, it is very hard to tell which model was easier for her to use. It should be noted that her usability score for the new GUI was much less than half of the old GUI. While it could be that she had become a bit more familiar with GUI components, it nevertheless gives a positive outlook on the usability of the new GUI. Although the usability score for the new GUI was lower for subject 2, it was probably due to the fact that the subject was learning how to use the GUI and learning the layout of the medications sheet. Subject 2 no mistakes (from confusing GUI components) in the new GUI as opposed to the 2 mistakes in the old GUI. In particular, he made mistakes when trying to add side effects in the old GUI. Comparatively speaking, the new GUI's side effect interface is consistent, has a good navigation scheme, and uses minimal amount of text to convey its meaning. Although it is certainly preferable to have a large sample size to be able to claim that the new GUI is more usable, the initial data results do seem indicate that the new GUI is more usable. Thus, we've shown that by following the principles of keeping the GUI a natural, simple, good navigation scheme, and consistent and giving it readable fonts, the new PMDB GUI seems more usable than the old PMDB GUI.

Chapter X: Bibliography

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Appendix A: Design Artifacts

New Medication

Times
① AM   PM

② Duration
[|▼]   [days |▼]

③ Initial Amount
   100 [▲▼] pills

④ Reason for taking
[   ]

[Previous] [Next]   [Cancel]

Times to take medication
① 24 checkboxes, 1 for each hour
② Duration   drop-down menus
③ Initial Amount   spin box
                    default (100)
④ Reason   J Text Area

New Medication

Purchased at
① [Doctors R US |▼] ② [Add New Location]

Date Prescribed
③ [Jan. 1 2006] ④ [Change date]

Prescribed by
⑤ [Mike, James |▼] ⑥ [Add new doctor]

[Previous] [Next]   [Cancel]

① Location   drop-down menu
② Add new location   JButton
③ Date prescribed   Label/JB
④ Change date   JButton
⑤ Prescribed by   Drop-down menu
⑥ Add new doctor   JButton

New Medication

Side Effects
medicine's side effects   All side effects
① [Drowsiness] ③ [<< Add] ② [Irritation] ⑤ [Create]
                ④ [>> Remove]   [Insomnia] ⑥
                                         [Done]

⑥ Notes
[   ]

[Previous] [Next]   [Cancel]

① Possible side effects   JList
② All side effects   JList
③ Add to possible side effects   JButton
④ Remove from possible side effects JButton
⑤ Create new side effect   JButton
⑥ Inactive JTextArea: will activate
   once user presses "create new"
   Press 'done' when done with entry.

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Summary

New Medication

- Name: Aspirin
- Take at: 12 pm, 3pm
- Amnt : 1 pill
- Dosage remaining: 100 pill
- Precautions : Take ...
- Description :
- Refills left : 5
- Reason: No reason
- Began taking:

[Previous] [Finish] [Cancel]

Medication Manager

MedName	Take	Amt
Tylenol	12pm	1 pill

Tylenol
- Dosage remaining: 100 pill
- Precautions: Take ...
- Description: begin
- Refills left : 1
- Reason : no reason
- Began taking: 2005-04-06
- Take until : 2006-01-02
- Prescribed by: Aldo, Jervis
- Prescribed at: APISA
- Expires: 2006-01-01
- Notes: No notes
- Duration: 1 day

[Add] [Edit] [Return]

Add → JButton proceeds to the first screen of adding a new medication

Edit → JButton proceeds to the first screen of adding a new medication with all information filled out.

Return → JButton returns to the main screen.

⚠ Fill out required fields:

[medication name]

[OK]

Pop-out window
Appears when user forgets to fill out all required fields in current panel.

"required" and "medication name" are highlighted in red. *

Note: All required fields are also highlighted in red.

13/12/06

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New Medication

Amount ① ②
1 ⟲ per day ▽

Times during day ③ ⑥ Time
④ 8:15 [addd]
[kmd] [3 ⟲] [30 ⟲] [am ▽] ⑦ ✗
⑤ ⑤

Duration ⑧ ⑨
1 ⟲ day(s) ▽

⑩ Initial Amount
100 ⟲

⑪ Reason for Taking

→ just figure it out!

① # of pills/doses to take a day
② day/Month/week
③ day/week/month depending on user specifications
④ List of times the user will take medication
⑤ Depending on user's choice in #2, will become day of the week, or day of week and week of the month.
⑥ Add medication time to list
⑦ Remove medication time
⑧ Duration (how long to continue taking medication)
⑨ days/weeks/months
⑩ Initial Amount: default = 100.
⑪ Reason for taking [J TextBox]

New Medication

① Purchased at ②
Pharmacy1 ▽ [Add location]

③ Pharmacy1
Address 17215 N. 3rd Drive
Phoenix, AZ 85023
e-mail: pharmacy1@pharmacy1.com
phone = (555) - 555-5555
fax = (555) - 555-5551

Date prescribed ⑤ ⑥
④ Jan ▽ 1 ⟲ 2007 ⟲

Prescribed by ⑧
⑦ Mike, Jones ▽ [Add doctor]

① Pharmacies that user bought drug from
② Add a new Pharmacy
③ Pharmacy Address/info
④ Month prescribed
⑤ date prescribed
⑥ Year prescribed
⑦ Doctor who prescribed
⑧ Add a new Doctor.

1/17/07

Appendix B: Transcript of Interviews

I. Transcript 1
Subject 1: Aliya Ma Lynn
Note: The dialog spoken between the author and the subject are in Chinese and English. The original dialog has been preserved. The translation is in bold. Words or phrases in square brackets ([ ]) were not part of the speech but used to bring in the context for the reader.

Speaker	Time	Speech
Qiyam	0:00	現在我要您做的是這些。這些是假裝說收進去這個program 裏。 **Now I want you to do these things. Pretend that you're going to enter these [medications] into the computer.**
Aliya	0:20	沒有這個，不是這個 **I don't have these [medications].**
Qiyam	0:22	沒有，不是說您的。假裝。 **No, not yours, pretend to add them.**
Aliya	0:25	假裝? **Pretend?**
Qiyam	0:26	對。假裝說您需要醫生給您這個。這個information就放進這個program。就打進去。就加這些四個，後面還有兩個，您不需要懂這是什麼。打進去就完了。 **Right. Pretend you the doctor gave you these medications. Put this information into the program. Just type them in. Just add these 4. Behind [this page] are two more. You don't need to understand what they are. All you need to is type in them.**
Aliya	0:54	我沒有用Tylenol. **I don't have Tylenol.**
Qiyam	0:55	這不是給您的奶奶，這是一個test。這說假裝說給您Tylenol您就應夾打進去。 **This isn't for you, grandma. This is a test. Pretend you were given the medication for Tylenol. You just hav eto type it in.**
Qiyam	1:13	好奶奶?我先把您log in。對不起奶奶。 **All right, grandma? I'll log you in now. Excuse me.**
Qiyam	1:32	好，奶奶。 **OK.**
Aliya	1:31	Dosage 1? **Dosage 1?**
Qiyam	1:35	Dosage 是一個。 **Dosage is 1.**
Aliya	1:40	Prescription? **Prescription?**
Aliya	1:59	November 1st, 2006? **November 1st, 2006?**
Qiyam	2:01	對，您這些不管奶奶，您大進去就完了。 **Right, you don't need to worry about that grandma, just type them in.**
Aliya	2:05	我打? **I should type them in?**

Qiyam	2:07	對對,現在用電腦大進去
		Right, right. Use the computer and enter them in.
Aliya	2:18	看不見,有燈嗎?
		I can't see it, is there a light?
Qiyam	2:21	開上了.
		I've opened it.
Aliya	2:25	這是什麼?
		What is this?
Aliya	2:44	我不用啊
		I don't use this.
Qiyam	2:47	沒有奶奶,您想辦法add medication.
		No, grandma. You should try to add this medication.
Aliya	2:58	叫我幹嗎?
		What am I supposed to do?
Qiyam	2:58	Add medication.
		Add medication.
Aliya	3:00	在那裏?
		Where?
Qiyam	3:02	就在這 您可以用那個mouse.
		Over here. You can use the mouse.
Aliya	3:09	除了這個我用什麼?
		Besides this, what do I use.
Qiyam	3:11	沒有.只用這個
		Nothing else. Just use this.
Qiyam	3:35	奶奶you're trying to add a medication.這是一個medication 奶奶他尊需您add medication.您就用這個program.
		Grandma, you're trying to add a medication. This is a medication, grandma. It allows you to add a medication. Just use this program.
Aliya	3:58	我的Thyroid可以嗎?我寫Thyroid可以嗎?
		Is my thyroid OK? Can I write thyroid?
Qiyam	4:05	沒有奶奶這是usability test.這不是您的medication.就說假裝是
		No, grandma. This is a usability test. This isn't your medication. Just pretend they are.
Aliya	4:28	我還是不明白什麼回事.
		I still don't understand what's going on.
Qiyam	4:32	這是Medications,對嗎奶奶這個program 幫您save medication. 放在電腦裏 您只需要把這些東西大進去這 這不像Microsoft Word 奶奶 您需要看一看,學用
		These are medications, right? This is a program that helps you save medications. Put in the computer. You only need to type these medications in. It's not Microsoft Word, grandma. You need to try it and learn how to use it.
Qiyam	5:10	您就add new medication
		Just add a new medication.
Aliya	5:15	Add new medication… 我想不起來呢個名字了.
		Add new medication… I can't remember the name, now.

Qiyam	5:16	奶奶, 不是您的, 不是您的, 您只需要看這個打進去這兒, 不是管您自己的 **Not the medications you're taking, grandma. You only need to enter these medications. It has nothing to do with your own.**
Aliya	5:28	哦他這個 … 他這個也沒有名字啊 **Oh, this… this doesn't have a name.**
Qiyam	5:34	有名字, 就在這兒 **It has a name. It's right here [points at paper]**
Aliya	5:37	Tylenol? **Tylenol?**
Qiyam	5:37	對 **Right.**
Aliya	5:39	你打Tylenol? 還是不是? **Type Tylenol? Right?**
Qiyam	5:41	是Tylenol. **It is Tylenol.**
Aliya	5:46	是Tylenol? **It is Tylenol?**
Aliya	5:51	哪裏去了? **Where did it go?**
Qiyam	6:01	您需要按這個 **You need to press this [points at add new med button]**
Aliya	6:06	這個? **This?**
Qiyam	6:07	對沒有,這個button. **Right. No, this button.**
Aliya	6:12	哦 就打在這兒 對了? **Oh. Just type in here. Right?**
Qiyam	6:25	您沒打進去 **You didn't type it in.**
Aliya	6:27	那怎麼搞地? **What's going on?**
Qiyam	6:28	您需要… **You need to…**
Aliya	6:33	這個? **This?**
Qiyam	6:33	恩 **Yeah.**
Aliya	6:43	還有什麼? 還有什麼? **What else is there? What else is there?**
Qiyam	6:49	您就看啊 我不可以告訴您的 **Look. I can't tell you that.**
Aliya	7:55	這怎麼不動了? **Why isn't this working?**
Qiyam	7:59	就在這兒 您想做什麼? **It's right here. What are you trying to do?**

Aliya	8:03	還有什麼message? **What message is left?**
Qiyam	8:07	這都是information. 這就是medication information. 跟這個一樣只需要改這些values. Change the values. **All of this is information. This is medication information. Just like this. You only need to change the values. Change the values.**
Aliya	8:31	這…yes 怎麼說? 如果說yes怎麼樣? **This… yes. How do you say that? If it's right, then what do I do?**
Qiyam	8:43	他不是yes/no. 它是不同的form: pill or liquid. **It's not a yes or no question. It holds different forms, pill or liquid.**
Aliya	9:04	寫liquid 可以嗎? **Can I write liquid?**
Qiyam	9:07	您就應該告訴這個說 它跟您說form. **You have to follow this [paper]. It will tell you its form.**
Aliya	9:14	那pill 就對了. **Then pill is correct.**
Qiyam	9:15	就對了. **Right.**
Aliya	9:17	那怎麼打? **How do I type this?**
Qiyam	9:18	就按就完了. **Just press it.**
Aliya	9:24	這個? **This?**
Qiyam	9:24	對了. **Right.**
Aliya	9:27	Dosage 1? **Dosage 1?**
Qiyam	9:28	Yeah. **Yeah.**
Aliya	9:31	還有什麼? **What else is there?**
Aliya	10:10	No description. No precaution. 對不對? **No description. No precaution. Right?**
Qiyam	10:14	您應該告訴這個說. 您看他這邊有description, precaution, 有missed dosage. 全不都應該… **You have to follow what this [paper] says. Look at this description/precaution. It has missed dosage. They all have to…**
Aliya	10:22	Side effects? **Side effects?**
Aliya	10:27	Side effects 是這個嘛? **Side effects… what is this?**
Qiyam	10:33	他不一樣 這是description. **They're not the same. This is the description.**
Aliya	10:37	Description? Description 是什麼? [Reading] Overdose can be fatal. **Description? What is description? [Reading] Overdose can be fatal.**

Aliya	10:56	你就寫 "overdose can be fatal?" **Just write "overdose can be fatal?"**
Qiyam	10:58	Yeah. **Yeah.**
Aliya	11:17	Precaution? **Precaution?**
Aliya	11:23	這是precaution. 那這個是precaution. **This is precaution. Then this is precaution.**
Aliya	12:26	什麼是missed dosage? 怎麼講? **What is missed dosage? What does it mean?**
Qiyam	12:29	Missed dosage 就是 when you forget to take it. 您忘記拿了該怎麼辦? 說 you have to take it at 12. 您忘記吃了,已經到五點該故什麼? **Missed dosage is when you forget to take it. What you're supposed to do when you forget to take the medicine.. Say, you have to take it at 12, You forgot to take it and it's already 5, what are you supposed to do?**
Aliya	12:52	把它畫掉? 是不是給他erase 掉? **Erase it? Am I supposed to erase it.**
Qiyam	12:56	隨更您 Whatever you think.
Aliya	13:02	[Reading] Do not take more than prescribed dosage. Do not take more than prescribed dosage. **[Reading] Do not take more than prescribed dosage. Do not take more than prescribed dosage.**
Aliya	14:20	完了.還有什麼? **Done. What else is there?**
Qiyam	14:25	您需要proceed.再加 **You need to proceed. Keep adding.**
Aliya	14:29	這邊有嗎? **Is there one here?**
Qiyam	14:30	還要加東西 **You still need to add something.**
Aliya	14:33	這邊? **Here?**
Qiyam	14:36	Press this button. 這個 "next." **Press this button. This: "next."**
Aliya	15:20	怎麼打不進呢? **Why can't I type it in?**
Qiyam	15:24	打不進 **You can't type into it.**
Aliya	15:33	怎麼打不進呢? Frequency. 什麼? Duration. 怎麼打不進? **Why can't I type into it. Frequency… what? Duration. Why can't I type it in.**
Qiyam	16:03	您就按 Press 那個 **Just press. Press that**.
Aliya	16:07	這個? **This?**

Aliya	16:32	這個怎麼又開了?又關了? **Why did this open again? And close again?**
Aliya	16:47	這是什麼 , initial amount ?我不懂這是什麼東西啊?什麼是100? **What is this "initial amount"? I don't understand what this is? What is 100?**
Qiyam	16:59	是100 pills. **It's 100 pills.**
Aliya	17:22	現在reason for.他怎麼搞得?打錯了? **Now, "reason for". What's wrong with it? Did I type incorrectly?**
Qiyam	17:27	對, 打錯了. **Right, you typed incorrectly.**
Aliya	17:41	怎麼搞地?啊！嗨！ **What's going on? Ah! Hai!**
Qiyam	18:16	您需要用mouse. **You need to use the mouse.**
Aliya	18:36	這個怎麼樣?這個又在這邊打怎麼回事?怎麼跑到哪兒去了呢?在這兒打? **What's this? This is here again; what's going on? How did you get there? Type here?**
Qiyam	18:49	沒有, 下面下面. **No, down. Further down.**
Aliya	18:51	還在下頭? **Still further down?**
Aliya	18:55	把no reason cross? **Cross out no reason?**
Qiyam	18:58	他是什麼reason 呢?您就看他是什麼reason. **What reason is it? Look at what the reason is.**
Aliya	19:33	完了?還有嗎? **Is it over? Is there more?**
Qiyam	19:36	您看他還有什麼? **Look at what is left.**
Qiyam	20:32	No, 您先click one .就是這邊. 這邊要加的東西, 您就方進哪兒 **No, first click one. Right here. You need to add something here. Just put it in there.**
Aliya	20:38	哦, 那就沒有了? **Oh, then there's nothing?**
Qiyam	20:41	那個沒關系 **That doesn't matter.**
Aliya	20:45	完了? **Done?**
Qiyam	20:51	您看者邊還需要加什麼? **Look, what else do you have to add here.**
Aliya	21:38	不能打, 怎麼搞得? **I can't type. What's going on?**
Qiyam	21:42	您要做什麼? **What are you trying to do?**
Aliya	21:43	我要寫2 days. **I want to write 2 days.**

Qiyam	21:49	他這邊duration 是說什麼的？ **Look at the duration. What does it say?**
Aliya	21:53	Duration, 1 day. 1 day 為什麼要加"s?" **Duration. 1 day. 1 day. Why does day have an "s?"**
Qiyam	22:06	那個沒關係 **Don't worry about that.**
Aliya	22:09	One pill per day. And then?完了？ **One pill per day. And then? Done？**
Qiyam	22:11	您弄對了，是days但是．． **You did it correctly, it is "days," but…**
Aliya	22:18	啊?Where's the duration? **Huh? Where's the duration?**
Qiyam	22:22	就在這兒. **It's right here.**
Aliya	23:04	好了. Initial amount 1 pill. **OK. Initial amount 1 pill**
Qiyam	23:09	那是，您看，他說多少？ **That is… look. How much did you say it was?**
Aliya	23:13	啊?Initial amount 100? Why 100? 我也不懂 **What? Initial amount 100? Why 100? I don't understand.**
Qiyam	23:18	您不需要管為什麼．打進去就完了． **You don't have to worry why, just type it in.**
Aliya	23:24	And then? **And then?**
Qiyam	23:26	好，那您看還需要做什麼？ **OK, then look at what you need to do.**
Aliya	23:39	沒有了，還有馬？ **There's nothing left. Is there something else?**
Qiyam	23:45	但是時間呢? **What about the time?**
Aliya	23:49	Time 在那裏?Time 應該寫在那裏？ **Where is time? Where should I write the time?**
Qiyam	23:55	在這兒. On your left side. 左邊 **Right here. On your left side. Your left side.**
Aliya	24:09	8 am? 怎麼樣?Highlight? **8 am? What about it? Highlight?**
Qiyam	24:15	沒有. 就那樣就弄對了. **No, just as you've done it.**
Aliya	24:17	寫在那裏?夠了？好了？ **Where do I right it? Enough? Is it all right?**
Qiyam	24:29	好 **It's fine.**
Aliya	24:30	And then? **And then?**
Qiyam	24:31	那您就go to the next screen, 奶奶 **Then go to the next screen, grandma.**

Aliya	24:35	下面? **Down?**
Qiyam	24:37	Uh..對您按page down 沒有用的 就像上次 **Uh… right. Pressing "page down" won't down anything. Just do it like last time.**
Aliya	24:59	Purchased at?他沒有name 嗎? **Purchased at? It doesn't have a name.**
Qiyam	25:02	那就是名字啊 那您看一樣嗎?這邊奶奶 **That is the name. Look, is it the same? Right here, grandma.**
Aliya	25:35	Purchased at… Pills 'N More. 那就對了 **Purchased at… Pill 'N More. Then it's right.**
Qiyam	25:39	那就對了, 好. **Then it's right. OK.**
Aliya	25:44	And then? First name? 這不需用寫了? **And then? First name? I don't need to write this?**
Qiyam	25:58	這只是phone number, 給您看store information. **This is the phone number. It shows you the store information.**
Aliya	26:10	那就完了? **Then I'm done?**
Qiyam	26:12	繼續 **Continue.**
Aliya	26:31	對嗎?Michael Jones **Is that right? Michael Jones [referring to the doctor who prescribed the medication].**
Qiyam	26:17	對的 **It's right.**
Qiyam	27:00	這是 drop-down box. 您不可以洗掉, 就可以select from the menu. 您看它給您list options. **This is a drop-down box. You can't erase anything from it. You can select from the menu. Look, it lists options.**
Aliya	27:15	哦, 哦, 哦 **Oh, oh, oh.**
Aliya	27:31	哈, 這個手怎麼．．．? **Ha! Why is my hand so…? [has trouble selecting correct item from menu]**
Aliya	27:49	要寫嗎?2007? **Should I write it? 2007?**
Qiyam	27:51	對. Change the date. April 您已經打進去了. **Yeah. Change the date. You've already entered April.**
Aliya	27:59	還需要寫嗎? **Do I still have to write?**
Qiyam	28:06	您需要change the day and the year. 這個就像剛剛的您只能select. **You need to change the day and the year. This is just like the one you did before. All you need to do is select.**
Aliya	28:27	哦哦,OK. **Oh, oh, OK.**

Aliya	29:12	沒有打上去他沒有東西出來
		It didn't get on the screen. Nothing is showing up.
Qiyam	29:30	您應該用這個
		You have to use this.
Aliya	29:46	看不見哪裏有exhaustion? 沒有?可以create new?
		I can't see where "exhaustion" is. Does it not exist? Can I create new?
Qiyam	29:59	對您create new 啦您現在就打
		Right. Create new. Now type.
Aliya	30:08	不需要去掉?
		I don't need to get rid of it?
Qiyam	30:08	不.
		No.
Aliya	30:15	還不出來 And then? 放在這邊?
		It's still not showing up. And then? Where do I put it?
Qiyam	30:25	打OK.
		Hit OK.
Qiyam	30:57	您就按finished.
		Just press finished.
Aliya	31:08	完了?
		Done?
Qiyam	31:11	好了,您加了這個還有這個還有兩個
		OK. You've added this [medication]. You have 2 left.
Aliya	31:59	進去了嗎?
		Has it been entered?
Qiyam	32:00	沒有,您應該按
		No, you need to press.
Aliya	31:15	按那裏啊? 啊 OK.
		Where do I press? Oh, OK.
Aliya	35:40	完了?是不是?
		Done? Are we done?
Qiyam	35:45	您要做什麼? Move on. 按next.
		What are you trying to do? Move on. Press next.
Aliya	35:58	這是frequency?這下面的?
		Is this frequency? Below it?
Qiyam	36:06	對
		Right.
Aliya	36:38	Time 在那裏
		Where is the time?
Qiyam	36:40	您剛剛就按了.
		You've already done it.
Aliya	37:20	Prescription 在那裏?
		Where is the prescription?
Qiyam	37:25	您已經寫過了.
		You've already entered it.
Aliya	37:40	沒有了?No reason?是不是?有reason沒有?
		No more? No reason? Right? Is there a reason?

Qiyam	37:54	Reason 在這兒 **Reason is here.**
Aliya	38:20	這個? No reason? **This? No reason?**
Qiyam	38:23	Yeah. **Yeah.**
Aliya	39:32	First name 是什麼?還是Diuril? **Is it first name? Or Diuril?**
Qiyam	39:37	您念這兒 他是什麼?他是purchased at. 那裏買的 **Read here. What does it say? It says purchased at. Where was it bought?**
Aliya	39:44	哦 **Oh.**
Aliya	40:54	這不要了,是不是? **We don't want this, right?**
Qiyam	40:58	奶奶這是個…您可以select.您不需要打進去 **Grandma, this… you can select [from the menu]. You cannot delete it [any entry].**
Aliya	41:05	哦哦 **Oh, oh.**
Aliya	42:00	Next? **Next?**
Qiyam	42:01	Yeah **Yeah.**
Aliya	42:25	對了, Michael Jones 對了? **Is this right? Michael Jones?**
Qiyam	42:26	這是第一個奶奶(first medication info).您在作第二個現在 **This is the first one grandma. You're working on the second [medication].**
Aliya	42:38	Jackson, David? **Jackson, David?**
Qiyam	42:39	恩 **Right.**
Aliya	43:23	怎麼弄上去啊? **How do I enter it?**
Qiyam	43:24	您按他, 放開的時候您要click 他 **Just press it. Let it go. You want to click it. [she is holding the button down and not releasing it]**
Aliya	44:00	怎麼搞得? **What's going on?**
Qiyam	44:03	您就按他 按得時候不要動 **Just press it. When you're pressing it, don't let move.**
Qiyam	44:26	就按他 **Just press it.**
Aliya	46:37	這得自己打, 對不對? **I'm supposed to type this in myself, correct? [as opposed to selecting from a menu]**

Qiyam	46:41	對. **Correct.**
Aliya	47:51	那去了? **Where did it go? [didn't click on side effects text field]**
Qiyam	47:55	您按錯了, 按這邊 **You pressed the wrong button, press over here.**
Aliya	50:30	完了?還有next嗎? **Done? Is there a next?**
Qiyam	50:42	沒有. **No.**
Aliya	50:56	要寫note嗎? **Should I write notes?**
Qiyam	51:06	您做完了奶奶, finished. 按finished. **You've finished, grandma, press finished.**
Aliya	51:08	哦 **Oh.**
Qiyam	51:20	還需要做這些兩個 **You still have to do these two.**
Aliya	51:47	打在哪兒?這邊? **Where do I type it in? Here?**
Qiyam	51:50	沒有, 您要add a new medication奶奶 **No, just add a new medication, grandma.**
Aliya	52:09	這個? **This?**
Qiyam	52:10	恩 **Yeah.**
Aliya	52:45	這個是expiration date.不管了? **This is the expiration date. Should I not worry about it?**
Qiyam	52:52	這邊沒有expiration date. **This [panel] doesn't have an expiration date.**
Aliya	55:02	就完了? **Am I done?**
Qiyam	55:06	隨便您 您就這樣做 **Whatever you want; just follow the paper.**
Aliya	57:12	他沒有了.還有嗎?15 days? 沒有了. **It's not there anymore. Is there anymore? 15 days? It's not there.**
Qiyam	57:26	有, 您就按, 在安一次. 按這個arrow. **It is there. Just press it. Press it again. Press this arrow.**
Qiyam	58:04	奶奶, 您click就完了. 不需要按住. Click, 就放開 **Grandma, just click it. You don't need to hold it. Just click.**
Aliya	59:09	有了嗎?9 and 4? 我按了, 怎麼沒有? **Is 9 and 4 already entered? I pressed it, so why isn't it there.**
Qiyam	59:15	有了. **It's there.**
Aliya	1:01:44	這是Salbultamol? **Is this Salbultamol?**

Qiyam	1:01:48	沒有, 這是一樣的 **No, this is the same [medication].**
Aliya	1:02:03	Purchased at… Modern Medicine? **Purchased at… Modern Medicine?**
Qiyam	1:02:18	沒有, 您看錯了. 看這個 **No, you got it wrong. Look here.**
Aliya	1:02:22	Purchased at, Pills'N More, 那就對了. Next? **Purchased at, Pill'N More. Then it's right. Next?**
Qiyam	1:20:30	隨便奶奶 **As you please.**
Aliya	1:02:45	這個對了?這個錯了?是不是?Michael Jones? Michael Jones? 一樣? **Is this right? Is this wrong? Right? Michael Jones? Michael Jones? Is it the same?**
Qiyam	1:02:52	不一樣 **It's not the same.**
Aliya	1:03:00	Purchased by… Howard. **Purchased by… Howard.**
Aliya	1:03:25	Sudden faintness, headache, depression… **Sudden faintness, headache, depression… [reading off side effects]**
Aliya	1:03:55	怎麼不對了?我打了什麼?我碰了什麼了? **Why is it wrong? What did I type? What did I touch?**
Qiyam	1:04:04	您按了space, 沒關系, 沒關系 那一個不管了, 您做完了. 您就加這個 **You pressed space. It's all right, not a problem. Don't worry about that [medication] anymore. You've finished it. Just add this one. [She tried adding all medications by typing the medication name followed by space instead of pressing OK. The dotted line was over cancel and by pressing space, she canceled the adding of the new medication]**
Aliya	1:04:30	這個不是這個 不是這個 **This isn't the one. This isn't the one.**
Qiyam	1:04:35	沒有, 您剛剛quit 了. 洗掉了, 您剛剛做的洗掉了. 沒關系, 您加後一個 **You've just quit. You've erased it, the one you were working on has been erased. It's all right, just add the next one.**
Aliya	1:04:47	在那裏加?這個回去? **Over here? Go back? [pointing at the return home button]**
Qiyam	1:04:55	Add new medication. **Add new medication.**
Aliya	1:05:05	這個? **This one?**
Qiyam	1:05:08	對. **Yes.**
Aliya	1:10:10	完了? **Done?**
Qiyam	1:10:19	下一個 **Next one.**
Aliya	1:13:26	完了? **Done?**

Qiyam	1:13:27	好，隨您便
		Whatever you wish.
Aliya	1:13:35	New location 是什麽？
		What is "new location"?
Qiyam	1:13:40	您不管.
		Don't worry about that.
Aliya	1:15:41	Side effect.. exhaustion. 我哪裏知道，我也不用這個藥
		Side effect.. exhaustion. How should I know? I don't take these medicines.
Qiyam	1:15:48	這不是說您會不會，這就是說，就加這些就完了.
		This isn't whether you know it or not. Just add it in.
Aliya	1:15:55	Side effect? What side effect?
		Side effect? What side effect?
Aliya	1:16:26	要寫上這個dizziness 嗎？
		Should I write "dizziness"?
Qiyam	1:16:30	就是要您做的.
		That's exactly what you're supposed to do.
Aliya	1:16:33	我不知道是什麽. 我那裏懂這個. 我又不用這個藥.
		I don't know what it is. How am I supposed to know about this [medication]. I don't even use these medications.
Qiyam	1:16:41	不是說您會不會奶奶.
		It's not whether you know it or not, grandma.
Aliya	1:16:50	Dizziness. OK. 還有什麽？
		Dizziness. OK. What else?
Aliya	1:17:01	沒有打進去啊
		You didn't type it in.
Aliya	1:17:18	怎麽沒有打進去？
		How did I not type it in?
Qiyam	1:17:20	您看嗎 You're trying to add a new side effect, 奶奶
		Look. You're trying to add a new side effect, grandma.
Aliya	1:17:25	這邊？
		Here?
Qiyam	1:17:30	沒有
		No.
Aliya	1:17:31	這邊？
		Here?
Qiyam	1:17:32	您看他這邊
		Look over here.
Aliya	1:17:47	And then? 完了？
		And then? Done?
Qiyam	1:17:52	Press OK.
		Press OK.
Aliya	1:18:14	完了？
		Am I done?
Qiyam	1:18:16	這個作完以後，只要您做這些，第一個您change這個medication. 換他的refills 到10.
		After you've done this, all you need to do are these. First, change the medication. Change the number of refills to 10.

Aliya	1:18:55	打在哪兒呢?打在這邊?
		Where? Where is it?
Qiyam	1:18:58	您需要edit 他
		You need to edit it.
Aliya	1:19:02	這邊?
		Here?
Qiyam	1:19:03	對
		Yes.
Aliya	1:19:06	給他一換成10啊?
		Change it to 10?
Qiyam	1:19:10	對.
		Yes.
Aliya	1:19:28	Change refill to 10. 哪裏有refill?
		Change refill to 10. Where is refill?
Qiyam	1:19:27	您現在需要edit他, 這都是您加的, 您需要去換
		You now need to edit it. This was all added by you. You need to change it.
Aliya	1:19:33	And then? 在那裏打換呢?
		And then? Where should I change it?
Qiyam	1:19:35	您就按Diuril.您就按這個, 還有去edit.
		Just change Diuril. Chagne this. And go to edit.
Aliya	1:20:10	Dosage… 10? 那死掉了。
		Dosage… 10? It's dead.
Qiyam	1:20:08	您是要換refills.
		You want to change refills.
Aliya	1:20:38	And then next? Next, 對嗎?
		And then next? Next, right?
Qiyam	1:20:42	Save, save.
		Save, save.
Aliya	1:20:45	Next.
		Next.
Qiyam	1:20:47	您只需要換這一點, 您換了。All you have to do now is save, 奶奶
		You only needed to change a bit [of the medication]. You changed it. All you have to do now is save, grandma.
Aliya	1:21:06	完了?
		Am I done?
Qiyam	1:21:08	Press save.
		Press save.
Aliya	1:21:09	完了?
		Done?
Qiyam	1:21:10	還有現在換第二個 Tylenol, 把它名字換到Advil.
		You still need to change these 2. Change Tylenol's name to Advil.
Aliya	1:21:53	哪裏有Advil?
		Where is Advil?
Qiyam	1:21:56	您是要換他名字。Change its name to Advil.
		You are supposed to change its name. Change its name to Advil.

Aliya	1:22:04	哪裏有changing the name? Prescription? 這邊? **Where is "changing the name"? Prescription? Here?**
Qiyam	1:22:13	沒有，就在這兒奶奶。 **No, it's right here, grandma.**
Aliya	1:22:28	沒有啊 **I don't see it.**
Qiyam	1:22:28	這是您打進去它的名字啊。您需要換它的名字現在。 **This is the place where you entered the name. You need to change its name, now.**
Aliya	1:22:42	需要自己打? **Do I need to type it myself.**
Qiyam	1:22:43	需要自己打地。 **You need to type it yourself.**
Aliya	1:23:07	還有什麼? **What else is there?**
Qiyam	1:23:10	就save就完了。 **Just press save.**
Aliya	1:23:15	完了?還有什麼?還有什麼?沒了? **Done? What else is there? What else is there? Is there anything left?**
Qiyam	1:23:18	再看啊，他這邊還有。 **Look again. It still has some [information].**
Qiyam	1:23:33	No,您沒有加那個。Move on to the next one. **No, you didn't add that one. Move on to the next one. [vasotec medication was accidentally canceled, so she cannot edit it]**
Aliya	1:23:39	這個? **This one?**
Qiyam	1:23:43	恩。 **Yes.**
Aliya	1:23:47	這個要換什麼? **What am I supposed to change?**
Qiyam	1:23:50	他寫地。 **It says here.**
Aliya	1:23:53	Remove 12 from the list and add 10 am.這個? **Remove 12 from the list and add 10 am. This one?**
Qiyam	1:24:14	Edit, 您先去edit. **Edit. First edit.**
Qiyam	1:24:21	沒按到。 **You didn't press it.**
Aliya	1:24:34	這是dosage嗎? **Is this dosage?**
Qiyam	1:24:36	沒有，這是times. **No, this is times.**
Aliya	1:25:10	完了?Then save? 是不是。 **Done? Then save, right?**
Qiyam	1:25:19	好，這一點作完了。還要做一次。 **OK, you've finished this. Now, you need to do it again.**

Aliya	1:25:28	我要死了。 **I'm going to die.**
Qiyam	1:25:46	我先換一換。 **I'm going to change it [resetting the database].**
Qiyam	1:26:36	好，現在是一莫一樣，但是他換了他的方法，所以您就再做一次，如果您還有力氣作。 **OK, now just like before, except the method has changed. So you need to add it again. That is, if you can still do it.**
Aliya	1:26:41	再做什麼？ **Do what again?**
Qiyam	1:26:43	就是在add這些medications。 **Just add these medications.**
Aliya	1:26:46	Tylenol? 這個name? **Tylenol? This name?**
Qiyam	1:26:53	奶奶您需要add new medication。 **Grandma, you need to add new medication.**
Aliya	1:27:59	對地怎麼說？ **How do I say it's right?**
Qiyam	1:28:01	對了就不管。 **You just don't do anything with it.**
Aliya	1:31:32	Erase在那裏我都忘了. 哪兒去了? **Where is erase? I forgot? Where did it go?**
Aliya	1:32:30	給那個燈開一開我看不見! **Open the light, I can't read it!**
Qiyam	1:32:50	您弄不完了不管了. 就繼續作 **If you can't finish it [the particular task], just move on.**
Aliya	1:33:06	完了.對不對?還有什麼? **Done. Right? What else is there?**
Qiyam	1:33:14	還有.再做 **There is still some more. Keep doing it.**
Aliya	1:33:25	這個doctor 對不對? **Is this the right doctor?**
Qiyam	1:33:28	就看這裡 **Look here.**
Aliya	1:33:35	Jones, Michael. 對了. New doctor? **Jones, Michael. That's right. New doctor?**
Qiyam	1:33:40	不要您以經作了.不需要加了. **Don't. You've already done it. You don't need to add him.**
Aliya	1:33:42	這個date prescribed… November 1st, 對吧是不是November 1st? **This date prescribed… November 1st, right? Is it November 1st?**
Qiyam	1:33:54	對對. **Right, right.**
Aliya	1:34:23	Yeah. OK. 還有什麼?Purchased at? Pills 'N More? 對了? **Yeah. OK. What else is there? Purchased at? Pills 'N More? Right?**
Qiyam	1:34:40	恩 **Yeah.**

Aliya	1:34:46	Reason? No reason. 是不是?
		Reason? No reason. Right?
Qiyam	1:34:50	Yeah.
		Yeah.
Aliya	1:34:54	這是什麼? Side effects? Exhaustion.
		What is this? Side effects? Exhaustion.
Aliya	1:35:21	怎麼搞地?
		What's going on?
Qiyam	1:35:24	您應該按這邊 按這個 這是add new side effect. Add 以後, 就可以放進menu.
		You have to click here. Click this. This one. This is add new side effect. After you've added it, you can put it on the menu.
Aliya	1:35:32	放這個?
		This one?
Qiyam	1:35:33	對 沒有, 這邊就可以了.
		Right. No, just over here.
Aliya	1:35:44	還有什麼?
		What else is there?
Qiyam	1:35:54	您需要add side effect. 這只是打進去 還沒add.
		You need to add side effect. You have to type it in, there isn't an add.
Aliya	1:36:00	Side effect 是什麼?
		What is side effect?
Qiyam	1:36:05	您已經打進去了. 現在只需要add.
		You've already typed it in. Now just add it.
Aliya	1:36:17	Add 什麼東西?
		Add what?
Qiyam	1:36:05	您打進去了side effect, you need to add it.
		You've entered the side effect, you need to add it.
Aliya	1:36:27	Need to add what?
		Need to add what?
Qiyam	1:36:30	這邊 奶奶
		Over here, grandma.
Aliya	136:35	怎麼講? 行了?
		How so? Is this all right?
Qiyam	1:36:46	隨更 您要怎麼樣做就怎麼樣作 這不是看您做對錯
		Whatever you want. This isn't testing to see whether you're getting this right or wrong.
Aliya	1:36:52	And then? 還有什麼? 這不是side effect 在了嗎?
		And then? What else is there? Isn't side effect already here?
Qiyam	1:36:59	這是不同的side effects. 隨更了 奶奶 您看不懂就看不懂 這不是看您答對錯的
		This isn't the same side effect. Whatever. If you don't understand it then it's fine. You're not being tested on whether you know it or not.
Aliya	1:37:11	Next?
		Next.
Qiyam	1:37:12	好
		OK.

Aliya	1:37:17	Initial amount? 10 days? 為什麼10 days? 他這邊是100. 那一個對?
		Initial amount? 10 days? Why 10 days? It says here 100. Which one is right?
Qiyam	1:37:32	就是紙上地
		The one on the paper.
Aliya	1:38:36	Side effect? 這是什麼? Duration… 6 months.
		Side effect? What is this? Duration… 6 months.
Qiyam	1:38:48	您看錯了奶奶. 是在這邊
		You're looking at the wrong one. It's here, grandma.
Aliya	1:39:40	還有嗎?
		Any more?
Qiyam	1:39:41	現在只有時間 times.
		Now there is only times.
Aliya	1:39:57	8 am. 對了. 是不是? 對了? Next? OK, 完了?
		8 am. Right? [looked at the default time to add and assume it was already added] Right? Next? OK, are we done?
Qiyam	1:40:12	沒有, actually, 您還需要 add an item here. 您的 times 是 8 am, 但是它只是幫您選的. 您需要 add. 您就按 add.
		No, actually, you need to add an item here. Your times is 8 am. But it only allows you to choose the time. You need to add it.
Aliya	1:40:27	好了? Next? 是不是?
		OK? Next? Right?
Qiyam	1:40:32	Yeah.
		Yeah.
Aliya	1:40:35	又 Tylenol 來了.
		Tylenol again?
Qiyam	1:40:37	沒有, 他只是 summary.
		No, this is its summary.
Aliya	1:40:44	那作什麼呢? 就 finish?
		Then what am I supposed to do? Finish?
Qiyam	1:40:48	Yeah.
		Yeah.
Qiyam	1:41:14	好, 您加第二個. 沒有, you want to add a new one.
		OK, you should add the second one. No, you want to add a new one.
Aliya	1:41:48	不是這個, 哪裏有?
		It's not this one. Where is it?
Qiyam	1:41:52	沒有啊, 您就再寫新的啊
		No, you want to write a new one.
Qiyam	1:42:02	名字也需要換
		You need to change the name.
Aliya	1:42:08	在那兒換呢?
		Where do I change it?
Qiyam	1:42:12	按上面, 他的名字就在這兒
		Press the button on top. Its name is right there.
Aliya	1:42:16	這兒?
		Here.

Qiyam	1:42:17	對.
		Right.
Aliya	1:42:48	還有？
		Anything else.
Qiyam	1:42:49	繼續
		Just continue.
Aliya	1:45:46	這是next了，是嗎？
		This is next, right?
Qiyam	1:45:47	Yeah.
		Yeah.
Aliya	1:46:27	Side effects 打在這邊？
		Do I enter side effects here?
Qiyam	1:46:30	您沒辦法 在這邊打。
		You can't. It's here.
Aliya	1:47:34	可以繼續打？
		Can I continue typing?
Qiyam	1:47:36	可以。
		You can.
Aliya	1:49:20	他到哪裏去了，不見了。
		Where did it go? It's disappeared.
Qiyam	1:49:24	都在，都在。
		It's all still here. It's all still here.
Aliya	1:49:25	And then? 還打什麼？完了？
		And then? What else? Are we done?
Qiyam	1:49:33	好.
		OK.
Aliya	1:50:29	不對，這邊不應該打. 對嗎？
		No, I shouldn't type here, right?
Qiyam	1:50:32	那是initial amount. Initial amount 在這
		That's initial amount. Initial amount is here.
Aliya	1:50:58	啊！
		Ah! [yelling out in frustration because she cannot get the number to show correctly]
Aliya	1:52:34	這個對了?怎麼寫？
		Is this right? How do I write it?
Qiyam	1:52:35	您需要add. Add to this.
		You need to add. Add to this.
Aliya	1:52:48	5 pm? 這得自己寫了？
		5 pm? I need to write this myself?
Qiyam	1:52:51	Yeah.
		Yeah.
Aliya	1:53:15	又沒有了，真是要我的命啊
		It's gone again. It's [the program] trying to kill me.
Aliya	1:53:33	5 哪兒去了呢？
		Where did 5 go?

Qiyam	1:53:35	5 就在這兒奶奶 **5 is right here, grandma.**
Aliya	1:53:51	完了沒有？ **Am I done yet?**
Qiyam	1:54:48	您還沒按finish. 好，那這些兩個就算了. 您就改這些兩個就完了. **You haven't pressed finished. OK. Then we'll not do these last two. All you need to do is change these two medications and we'll be done.**
Aliya	1:55:03	幹什麼？怎麼講？哪裏？ **Do what? What do you mean? Where?**
Qiyam	1:55:14	就在這兒. **Right here.**
Aliya	1:55:45	哪裏有10? **Where is 10?**
Qiyam	1:55:47	您是要換refills to 10奶奶 **You want to change refills to 10, grandma.**
Aliya	1:56:05	然後？ **And?**
Qiyam	1:56:07	您就keep pressing next. 一直按. 再按. 需要放開奶奶. 再按. 再click. **Just keep pressing next. Keep pressing it. Again. You need to let go, grandma. Press it again. Click again.**
Qiyam	1:56:57	好，改第二個就是Tylenol. 換他的名字，把它的名字換到Advil. **OK, correct the second one, Tylenol. Change its name to Advil.**
Aliya	1:57:50	對嗎？ **Is this right?**
Qiyam	1:57:51	**Yeah.**
Aliya	1:57:55	還有？ **And?**
Qiyam	1:57:56	您就save 它了. 再按. 再按. Next.再next.在一次. 放開. 再安一次. 好了. **Just save it. Press it again. Again. Next. Next again. One more time. Let go. Press it again. OK.**
	1:58:28	done

Transcript 2
Subject 2: Ameer Ayoub

Speaker	Time	Speech
Qiyam	0:00	All right. So what I'm going to have you do is, as I explained before, this is a medication manager, and what I'm going to have you do is add in these four medications. And if you have any questions on how to work or do things let me know, otherwise just get to it.
Ameer	0:21	OK.
Qiyam	0:25	OK.
Ameer	3:49	I notice when I put it in "date prescribed," it says November 1st, here. Go to the final thing, it says November 2nd.
Qiyam	3:57	Oh, don't worry about it.
Ameer	3:58	OK.
Ameer	13:40	This one in here, it says it's a liquid, but it says 3 pills per day.
Qiyam	13:47	It's 3 milliliters per day.
Ameer	13:49	OK.
Ameer	14:17	Do I make some suggestions now or…?
Qiyam	14:19	No, no, no.
Ameer	14:20	OK.
Qiyam	16:44	OK, so you can try finishing it.
Ameer	16:45	OK
Qiyam	16:51	So, what I'm going to ask you to do is I'm going to bring up a separate interface
Ameer	17:00	OK
Qiyam	17:12	I'll have to reset the database.
Qiyam	17:22	And I'm going to *put it on another light?*
Qiyam	17:40	OK
Ameer	17:40	Same thing?
Qiyam	17:41	Yup. Add the medications on another GUI.
Qiyam	27:26	Now that you've finished adding the medications, you can start editing them.
Ameer	27:33	All right.
Qiyam	28:43	So, at 3:47, you finished editing medications.
Qiyam	28:59	So, what I'm going to have you do is the obvious interview questions. So if

		you have any questions in particular. The first model is the second one and second one is the first.
Ameer	29:11	So this one is…?
Qiyam	29:12	That's the first one.
Ameer	29:14	OK.
Qiyam	29:23	So if you have any questions, go ahead and ask.
Qiyam	31:20	That's the end of our usability test, thank you for your time.

Appendix C: Usability Test Notes

Subject Aliya Ma Lynn_____
Date __4__ / __25__ / _07__

Category:

Old/Young	New-Old/Old-New	Familiar/Unfamiliar	Male/Female
Old	Old-New	Familiar	Female

Old GUI

Questions	Time (minutes)	Mistakes	Usability
20	90	18	128

New GUI

Questions	Time (minutes)	Mistakes	Usability
7	31	7	45

Start time: 9:43 am

GUI O/N	Q	M	Time (hh:mm)	Notes

O		x	9:50	Tried typing w/o adding medication.
O	X		9:54	Asked how to add a new medication (should be pressing add new med button)
O			9:55	Typed without clicking on the medication name textfield.
O	X		9:56	Question about form. Thinks that she is supposed to say yes if the information is correct.
O	2		9:58	Mixing up description with missed dosage instruction.
O		X	9:58	Entered wrong description.
O		X	10:01	Did not erase "No description" from description textarea.
O	X		10:02	Question on how to proceed
O		X	10:03	Tried changing frequency when frequency is just a label.
O		X	10:04	Entered headache in initial amount.
O		X	10:04	Tried typing dosage instead of selecting from drop-down box.
O	X		10:05	Move from spinner to text box.
O	X		10:10	Asked where duration is.
O	X		10:12	Did not understand that radio boxes, once clicked, is selected.
O	X		10:15	Explained what drop-down boxes are and how they work.
O		X	10:16	Couldn't add side effect exhaustion.
O		X	10:17	Couldn't read help pane.
O	X		10:17	Asked what she was supposed to add
O	X		10:18	Added Tylenol
O	X		10:19	Asked how to write name
O	X		10:27	She thought the information for purchased at was editable.
O		X	10:31	Problem w/clicking.
O	X		10:34	Didn't know whether she was supposed to type side effects in or select from menu.
O		X	10:34	She's typing but not looking at the screen, which isn't printing what she's typing.
O			10:35	Incorrectly types all side effects in one box.

O		X	10:38	Did not add side effects.
O		X	10:46	Adding duration.
O	X		10:48	Didn't know where to click to add reason.
O		3	10:56	Stopped adding. Changed # of refills to 5 even though it should be 0. Didn't change units to ounces.
O		X	10:58	Selected 12 am / 1 am/ 4 am instead of pm.
O		X	11:01	Selected wrong location
O		X	11:04	Didn't add dizziness (side effect).
O	2		11:04	Asked a question about adding side effects.
O	X		11:05	Question on she is supposed to start editing a medication (doesn't know to click on the "edit med" button).
O	X		11:10	Was told to press "save" to save medication information.
O		X	11:12	Couldn't change vasotec medication as she never finished adding it.
O			11:13	Finished adding/editing medication for old GUI.
N	X		11:15	Was told once again on how to add a new medication (press "add new med")
N		X	11:22	Did not add reason.
N	X		11:25	Did not know how to add side effects
N		X	11:30	Did not add side effects
N	X		11:32	Adding wrong time
N		X	11:34	Did not change description.
N	X		11:35	Asked where to add side effects
N		X	11:33	Did not add reason
N		X	11:37	Did not add side effects
N	X		11:40	Asked about how to add items
N		X	11:41	Finished adding 2 medications.
N		X	11:42	Asked a question on how to edit medication (press the edit button).
N	X		11:43	Asked how to save.

N	x		11:44	Asked how to edit again.
N			11:46	Finished editing.

End time: 11:46

Subject Ameer Ayoub
Date   4 / 25 / 07

Category:

Old/Young	New-Old/Old-New	Familiar/Unfamiliar	Male/Female
Young	New-Old	Familiar	Male

Old GUI

Questions	Time (minutes)	Mistakes	Usability
0	11	4	15

New GUI

Questions	Time (minutes)	Mistakes	Usability
0	16	3	19

Start time: 3:16 pm

GUI O/N	Q	M	Time (hh:mm)	Notes

N		X	3:19	Did not add description/precautions/etc.
N		X	3:21	Put Nov. 01 instead of Nov. 1
N			3:22	Added description, etc.
N			3:27	Uses summary page to make sure that information was entered correctly.
N		X	3:33	Added 1:00 am instead of 10:00 am
N			3:35	Finished with adding/editing medications for first GUI.
O			3:36	Started old GUI.
O			3:38	Didn't read instructions for adding side effects, but made no mistakes adding side effect.
O		X	3:39	Forgot to add reason, but went back and added it later.
O		X	3:41	Accidentally added exhaustion as a side effect for the second medication when trying to add hypoelectrolytemia.
O		X	3:43	Changed duration to 2 days instead of 15 weeks but corrected himself.
O		X	3:44	Accidentally deleted headache from list of medications.
O			3:45	Finished adding medications. Edited medications.
O			3:47	Editing done.

End time: 3:49 pm

Appendix D: Familiarity Questionnaire Data and Interview Questions Data
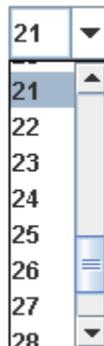
Subject _Aliya Ma Lynn___

Note: The bolded choices are the choices the user selected.

Interview Questions

Circle one of the 5 given choices.

1. How useful were the tabs that were in the first model in keeping track of where you were?
   1 = was confusing
   2 = slightly confusing
   3 = no difference
   4 = somewhat useful
   5 = was very useful

2. How much easier was it to focus on the task in the second model?
   1 = much more difficult
   2 = slightly more difficult
   3 = no difference
   4 = somewhat easier
   5 = much easier

3. How useful was the summary page in the second model?
   1 = very confusing
   2 = somewhat confusing
   3 = no difference
   4 = somewhat useful
   5 = very useful

4. How easy was it to add side effects in the second model compared to the first model?
   1 = very difficult
   2 = somewhat difficult
   3 = no difference
   4 = somewhat easier
   5 = much easier

A drop-down selection box:

A spinner: 21

5. How useful were the spinners for day and year (compared with drop-down selection box)?

1 = very unintuitive
2 = slightly unintuitive
3 = no difference
4 = somewhat useful
5 = very useful

Subject ___Ameer Ayoub____
Date __25/__4__/__07_

Interview Questions

Circle one of the 5 given choices.
1. How useful were the tabs that were in the first model in keeping track of where you were?
    1 = was confusing
    2 = slightly confusing
    3 = no difference
    4 = somewhat useful
    5 = was very useful

2. How much easier was it to focus on the task in the second model?
    1 = much more difficult
    2 = slightly more difficult
    3 = no difference
    4 = somewhat easier
    5 = much easier

3. How useful was the summary page in the second model?
    1 = very confusing
    2 = somewhat confusing
    3 = no difference
    4 = somewhat useful
    5 = very useful

4. How easy was it to add side effects in the second model compared to the first model?
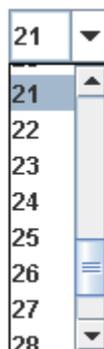   1 = very difficult
    2 = somewhat difficult
    3 = no difference
    4 = somewhat easier
    5 = much easier

A drop-down selection box:

21

21
22
23
24
25
26
27
28

A spinner: `21`

5. How useful were the spinners for day and year (compared with drop-down selection box)?

1 = very unintuitive
2 = slightly unintuitive
3 = no difference
4 = somewhat useful
5 = very useful

Note: the answers in **bold** are answers the subject selected.

Subject ___Aliya Ma Lynn_____

Date _5_ / _25_ / _07__

Familiarity Questionnaire:

Circle one of the following 1 of the four choices.

1. What program would you use to access the web page www.google.com?
   - a) a web browser
   - b) a spreadsheet
   - c) **a word processor**
   - d) a media player

2. What program would you use to create a research paper?
   - a) a spreadsheet
   - b) **a word processor**
   - c) a web browser
   - b) a media player

3. What best describes receiving information from the Internet?
   - a) uploading
   - b) getting
   - c) **downloading**
   - d) transferring

4. Which device is best used to transfer a file from one computer to another computer?
   - a) a floppy disk or USB flash drive.
   - b) **a mouse**
   - c) a headphone
   - d) a hard drive

5. How would you usually turn on a computer?
   - a) turn the monitor on
   - b) **press the power button on a computer**
   - c) nothing; it will turn itself on when you are ready
   - d) press the escape button

6. What is the most common problem when you try to print a document?
   - a) the printer prints in a different color
   - b) the printer prints a black page
   - c) **the printer has a paper jam**
   - d) the printer shuts itself off

7. When someone says that your computer is full, what does it usually mean?
   - a) **that your hard drive space has almost been used up**
   - b) that your computer has too many devices attached to it
   - c) that your computer has too many application open at once
   - d) that you have too many objects sitting on top of your computer

8. How would you usually close an application?
   - a) **press the x or red button on the top right side of the screen**
   - b) press the power button on your computer
   - c) press the delete key on the keyboard
   - d) press the escape button on the keyboard

9. How do you delete a file?
   - a) **select the file and type "erase"**

     b) shut down your computer
     c) select the file and hit the escape button
     d) drag the file into the recycle bin or trash can

10. Moving text or pictures from one document to another is commonly called what?
     a) save and transfer
     b) **copy and paste**
     c) backup
     d) create duplicate

Subject ____Ameer Ayoub_____
Date _5_ / _25_ / _07__

Familiarity Questionnaire:
Circle one of the following 1 of the four choices.

1. What program would you use to access the web page www.google.com?
   a) **a web browser**
   b) a spreadsheet
   c) a word processor
   d) a media player

2. What program would you use to create a research paper?
   a) a spreadsheet
   b) **a word processor**
   c) a web browser
   b) a media player

3. What best describes receiving information from the Internet?
   a) uploading
   b) getting
   c) **downloading**
   d) transferring

4. Which device is best used to transfer a file from one computer to another computer?
   a) **a floppy disk or USB flash drive.**
   b) a mouse
   c) a headphone
   d) a hard drive

5. How would you usually turn on a computer?
   a) turn the monitor on
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