St. Evangeline's Hospital for Children

Evangeline Haughney

Final Report – Hospital Lobby Kiosk HMK 7
Programming Usable Interfaces
May 3, 2004

Initial Design Rationale

In a hospital lobby, people are focused on 1) finding out where their friend or relative is in the hospital, 2) finding out where they need to go for an appointment, or 3) they are sitting around anxiously waiting for news. For these situations, many users can be in a state of cognitive tunneling, or an otherwise in a heightened state of awareness and mental stress.

In addition to dealing with users' increased cognitive load, a hospital information kiosk must also support a wide range of ages and cultures. Elderly patients need large fonts and large targets for buttons. For non-native English speakers, simple, plain English is better.

Taking all of these factors into account, I decided to implement an interface with large bright buttons that attract attention and are immediately visible on the screen with simple labels.

A note on privacy: I conducted a comparative analysis of several other hospital lobby kiosks to review how they dealt with Protected Medical Information (if at all) and I found one kiosk that directed users to a Nurse's Station for personal interaction. All other kiosks focused only on services and location and did not address finding a patient's location. For my initial design, I decided to only give users a generic message about the privacy of patient information. Based on user feedback, I learned that my attempt to satisfy contradicting HIPAA regulations and the user's goal ended up causing frustration. From my interactions with users, I learned that only partially satisfying the user was worse than not serving their needs at all.

Design 1

On the Welcome screen, the user could select from three buttons: "Find a Patient", "Hospital Services", and "Find a Department".

The Find a Patient screen contained a keyboard representation that allowed a user to search by last name. Regardless of what name they typed in, the search results displayed a message telling the user to go to the Nurse's station for more information.

The Hospital Services screen contained a list of buttons for information on services such as the florist, cafeteria, etc. Selecting a button displayed content on the right side of the screen.

The Find a Department screen displayed a map and a list of buttons for each department. Clicking on a department button showed the user their pathway through the hospital with a dotted red arrow.

Test Results (U1, U2)

- U1 commented on the alignment issues with the keyboard.
- U2 noticed that the department buttons were not alphabetized.
- U2 offered a design suggestion to include a "you are here" label on the department map.
- U1 was looking for the "next step" when reading the gift shop content information, "They didn't tell me where the gift shop is." At first, the user mentioned that she could not perform the task, "I don't think I can get her something." Later, when she viewed the department map and saw the Gift shop location on the map, she stated, "I see the gift shop so I should be able to pick something up."
- Both U1 and U2 were frustrated with the lack of information on the patient search results. Comments were: "What is the point of this at all?" and "That's not helpful".

Lessons learned

- Cardinal rule of thumb: Don't taunt the user with leading them down a path and then not offering anything substantive. A user's time is valuable, especially when they are standing in front of a kiosk.

- Users want to follow the information scent of what comes next in their mental model of the process. Anticipate where a path may lead and provide clear links to the next step.

- People notice alignment issues that you think they won't notice onscreen. People are less forgiving when they are looking at a computer screen than paper.

- Follow established standards. The visible "You are Here." label on way finding signage is something that is expected on directional maps.

Design 2

Design Changes

- Alphabetized the list of department buttons.
- Added more space between the keyboard rows and aligned the buttons.
- Updated the map to include labels for all departments and services such as the Florist and Church.
- Added a "You are here" label on the first frame of the map movie.
- Added an English/Spanish translation link on the welcome screen (not fully implemented).

- Changed the search results content to specify a department location for a patient.
- Added links to map directions for all hospital services and made them available from the services page.

Test Results (U3, U4, U5)

- U3 had a mental model similar to using an ATM screen where you are prompted to select a language prior to the first choice, so prior to any of the tasks, she selected the non-functioning "English" link to start the kiosk.
- U3 offered a concern that the button labels on welcome screen were too wordy for a hospital context.
- U5 made a mistake in the name entry, and asked out loud "where is Delete?" before seeing the Clear button.

Design 3

Design Changes

- Since Spanish translation was never implemented, I removed both English and Spanish link labels.
- Changed the labels to bring the keyword left to make the noun the first thing they see. Upon selecting the button, then they are given the different actions (or verbs) to choose from.
- *Not Implemented:* Since consistency in an interface is one of the most important heuristics (according to Nielsen), I decided to not move the Clear button to be part of the keyboard. Having one screen with the Clear button in a different location would cause additional confusion to the user.

Lessons Learned

- A flash kiosk is similar to a web page. Consequently, people have less navigation issues but have higher expectations for functionality. With the previous assignments, we used paper prototypes or we prototyped physical systems like the copier. People had an easier time accepting the prototypes as initial versions. Based on this observation, the next time I test a prototype kiosk with users, I would spend more time fully implementing a section than doing a basic implementation of all areas, especially if the sections were similar in navigation and functionality.

- Anticipate common mental models when implementing features from other systems. Map these out against the prototype to see if they are still supported.

- Get a USB mouse. With U5, testing revealed simulated "bugs" when really the user was using the touchpad and it recognized movement taps as selection taps.

- Localization efforts need to be planned in advance. Adding the Spanish for all the buttons at the later design would have been equivalent to implementing a second interface.

Future Enhancements

- This did not come up in any of the user tests, but by adding links from the Services page to the Map page, I added a layer of complexity that could confuse users. Provide a Quit button to return to the main screen to deal with nested navigation.
- Implement a full Spanish translation.

Test Script

Introduce myself
"Hello. My name is <insert name>, and I am conducting a usability test to evaluate a prototype of a Hospital Lobby Information Kiosk. Do you mind if I talk with you for a few minutes?"

Study instructions
"The point of today's test is to discover whether people have problems using this prototype Hospital Lobby Kiosk. I'm going to ask you to perform a set of tasks with this prototype. I'm testing the prototype, I'm not testing you. I'm looking for places where the prototype might be difficult to use, so if you can't do some things please don't feel bad. That is exactly what we are looking for. Remember, this is completely voluntary. Although I don't know why this would happen, if you become uncomfortable in any way feel free to stop. In this observation, I am interested in what you think about as you perform the task I will be asking you to do. I'm going to ask that you 'think aloud' while you are using the prototype. What I mean by 'think aloud' is that I want you to tell me EVERYTHING that you are thinking from the first time that you see the statement of the task until you finish the task. I would like you to talk aloud CONSTANTLY from the time I give you the task until you have completed it. I don't want you to try to plan out what you say or try to explain to me what you are saying. Just act as if you are alone, speaking to yourself – just a little louder.

Instruct them on how to think aloud: non-computer task
Let me demonstrate thinking-aloud for you as I review the directions from Pittsburgh to DC in my head.
<Illustrate thinking aloud>.
Now, you try thinking aloud. Here's a problem: please think aloud while you answer the question, 'How many windows are there in your mother's house?'
Good!

Final instructions
As you're doing the task, I won't be able to answer any questions. But if you do have questions, go ahead and ask them anyway so that I can learn more about what kinds of questions the prototype brings up. I'll answer your questions after the session. Also, if you forget to think aloud, I'll say, "Please keep talking." Do you have any questions about thinking aloud? Now, I have a task printed out for you.

Hand them the task and ask of they have any questions
"Here is the task you will be working on. Why don't you read it aloud, just so you can get comfortable with speaking your thoughts. Do you have any questions about the task?"

Tell them they may begin
"You may begin."

Task

Your friend Mr. Smith's daughter had an asthma attack and she is recovering at St. Evangeline's Hospital. You decide to go visit her after work to see how she is doing.

When you enter the hospital lobby, you see a touch-screen kiosk.

1. Check to see where your friend's child is.

2. You need to pick up some cold medicine. Find out where the Pharmacy is.

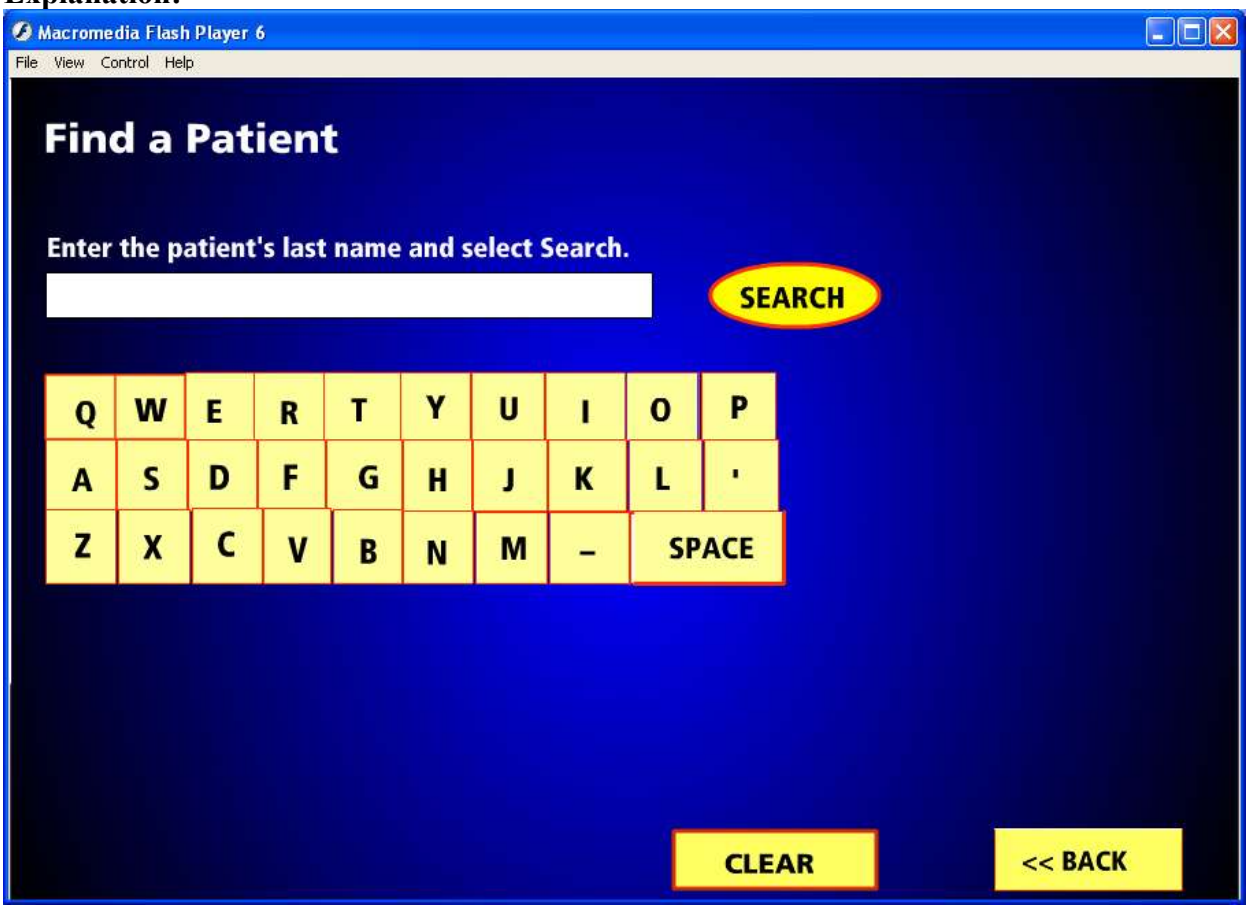
3. You forgot to stop by to pick up a present for her. Can you buy a teddy bear at the hospital?

PUI Template for Usability Aspect Report

Study Name: Hospital Lobby Kiosk– Design 1
Date of Study: April 19, 2004
Experimenters' Names: Evangeline Haughney
Subject ID: U1

No. TA-01	**Problem/Good Aspect** Problem
Name: Keyboard buttons not aligned	
Reference: Interview notes	
Evidence: U1 commented during Task 1, "the keys look kind of funky."	

Explanation:



There is a left-aligned representation of a QWERTY keyboard made out of buttons. Not all of the buttons are aligned with each other or have a consistent outline.

Severity or Benefit:
Severity Level: 1: Cosmetic
Frequency: This will impact all users.
Persistence: This will occur each time the user searches for a patient.
Impact: Distracts the user sufficiently for them to notice it.

Possible solution and/or trade-offs:
Re-do the buttons farther apart, with consistent alignment.

Tradeoffs: None that I can think of. There is plenty of space on the screen.

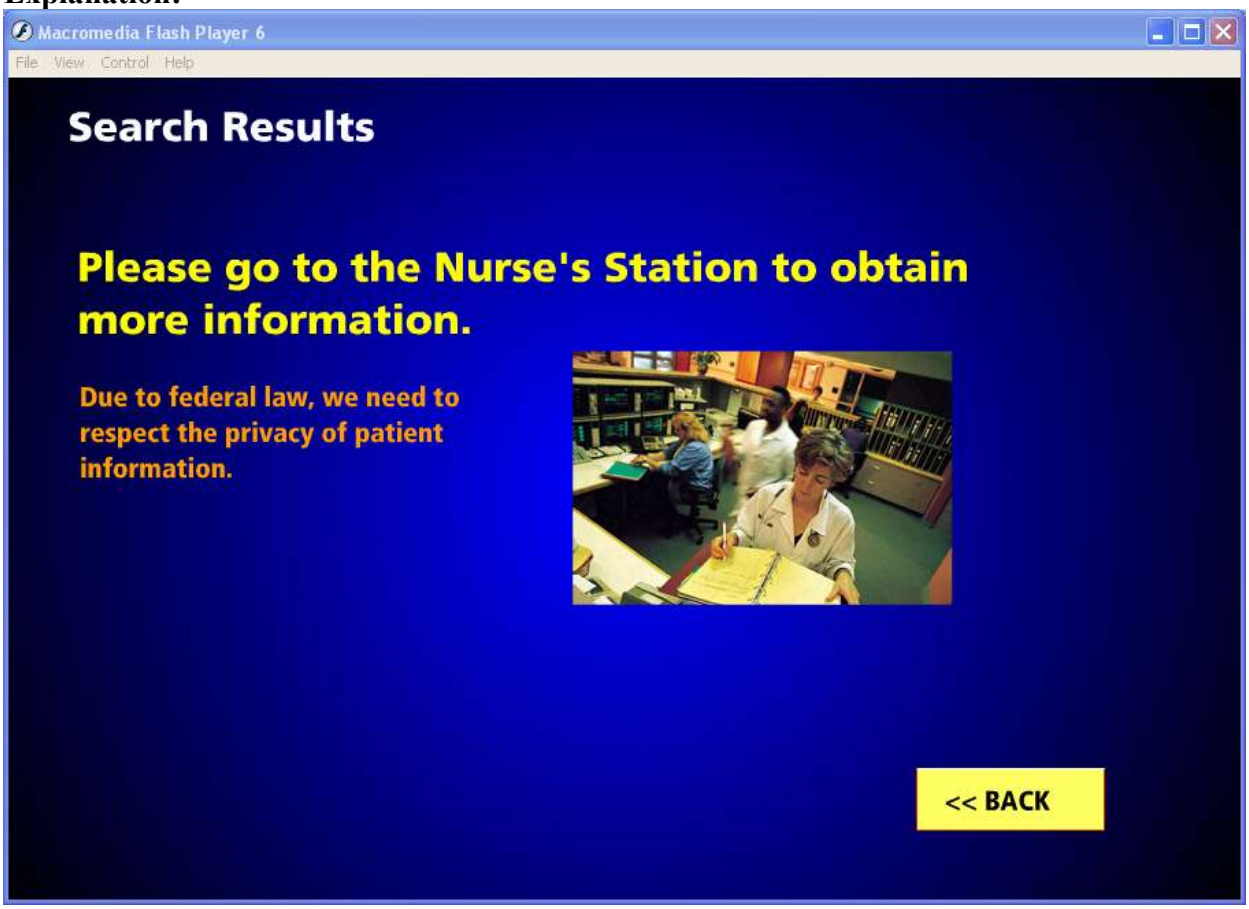
Relationships:
None at this time.

PUI Template for Usability Aspect Report

Study Name: Hospital Lobby Kiosk– Design 1
Date of Study: April 19, 2004
Experimenters' Names: Evangeline Haughney
Subject ID: U1, U2

No. TA-02	**Problem/Good Aspect** Problem
Name: Patient Search results not helpful	
Reference: Interview notes	
Evidence: U1 commented during Task 1, "That's not helpful." And "So I couldn't find out where she is" at the end of the task. U2 commented during Task 1, "OK. Darn. Now I have to deal with these busy people who won't want to talk to me."	

Explanation:



The user searches by name, and upon clicking Search, they see a screen that tells them to go to the Nurse's Station for more information. However, the screen does not tell them where the Nurses's Station is.

Severity or Benefit:
Severity Level: 4: Major Problem
Frequency: This will impact all users.
Persistence: This will occur each time the user searches for a patient.
Impact: User may become sufficiently frustrated to stop using the kiosk for any other questions.

Possible solution and/or trade-offs:
Based on HIPAA regulations, patient information such as are they admitted, cannot be given out unless there is written permission from the patient. However the users had very strong reactions to a search that did not provide any results, so for the purposes of this prototype and this assignment it may be best to just fake a patient search result.

Another possibility is to do what other hospital kiosks have done, which is to only include the department Nurse's Station to go to for information. This is only a partial solution, since it still does not tell whether a patient is admitted or not, and directs them to another source.

A final alternative would be to just remove this part of the kiosk.

Tradeoffs: For each solution, there are tradeoffs. First, providing patient information is illegal. Secondly, giving users a generic directive to go to another department still does not provide sufficient information. Lastly, finding a patient is one of the main goals of a user in a hospital lobby so removing this information from the kiosk reduces its effectiveness for the context of use.

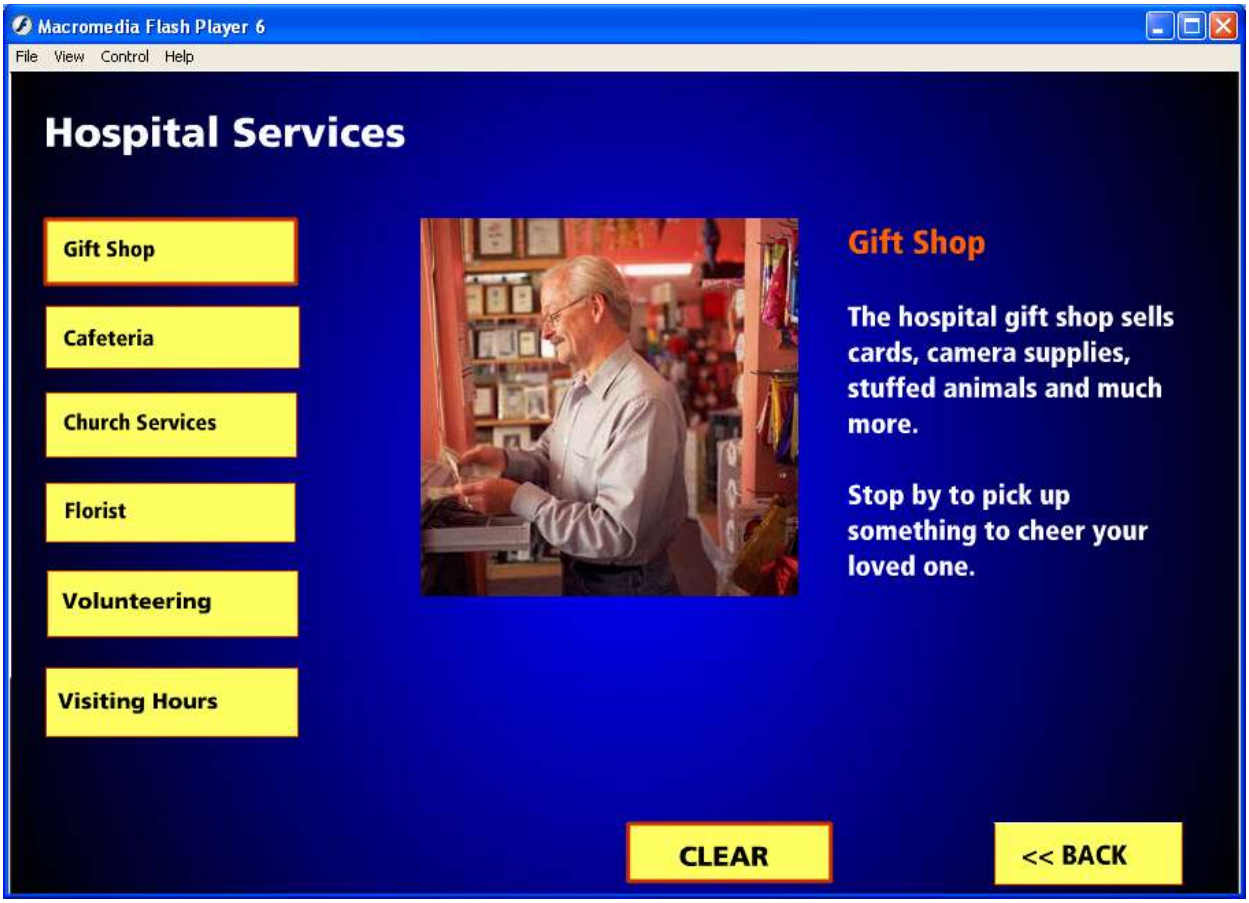
Relationships:
None at this time.

PUI Template for Usability Aspect Report

Study Name: Hospital Lobby Kiosk– Design 1
Date of Study: April 19, 2004
Experimenters' Names: Evangeline Haughney
Subject ID: U1, U2

No. TA-03	**Problem/Good Aspect** Problem
Name: No link to location on Services	
Reference: Interview notes	
Evidence: U1 commented during Task 3, "They didn't tell me where the gift shop is. User then went to the Department section and "Gift Shop" was not listed "So I don't think I can get her something." U2 commented during Task 2, "It also doesn't tell me where the Nurse's station is." U2 offered a design suggestion: "It would be good to have a map pointing to where it is." U2 commented during Task 3, "Again, no map."	

Explanation:



The information is listed on what the Gift Shop offers and sells, but not much else. Users want to know where to go if they want to buy something.

Severity or Benefit:
Severity Level: 3: Minor Problem
Frequency: This will impact all users.
Persistence: This will occur each time the user searches for the location of the gift shop.
Impact: U1 found the gift shop location by looking at the map itself but other users may become sufficiently frustrated to stop using the kiosk for any other questions.

Possible solution and/or trade-offs:
Add a link to the map with an animation that shows the gift shop location. Do this for the cafeteria, church services, and the florist.

Tradeoffs: Not all services will have a consistent link to a location, but users should be able to interpret that "visiting hours" does not have a specific location.

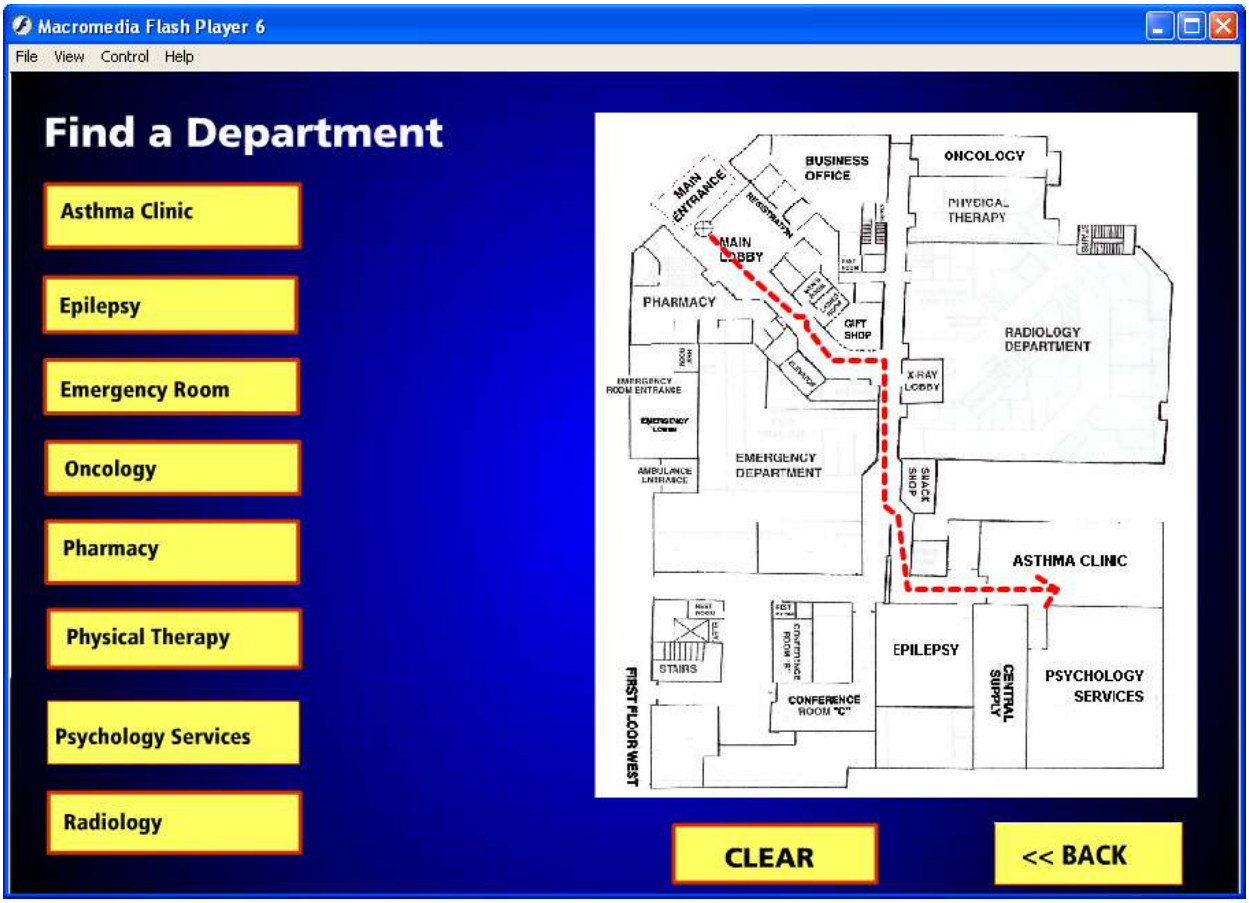
Relationships:
None at this time.

PUI Template for Usability Aspect Report

Study Name: Hospital Lobby Kiosk– Design 1
Date of Study: April 20, 2004
Experimenters' Names: Evangeline Haughney
Subject ID: U2

No. TA-04	**Problem/Good Aspect** Good
Name: Map animation helpful	
Reference: Interview notes	
Evidence: U2 commented during Task 2, "There's a map. Hmmn, that's good."	

Explanation:



Severity or Benefit:
Severity Level: N/A
Frequency: This will be seen by all users.
Persistence: This will be used by all users.

Possible solution and/or trade-offs:

Tradeoffs: Increased clutter on the screen, especially covering up the smaller corridor areas.

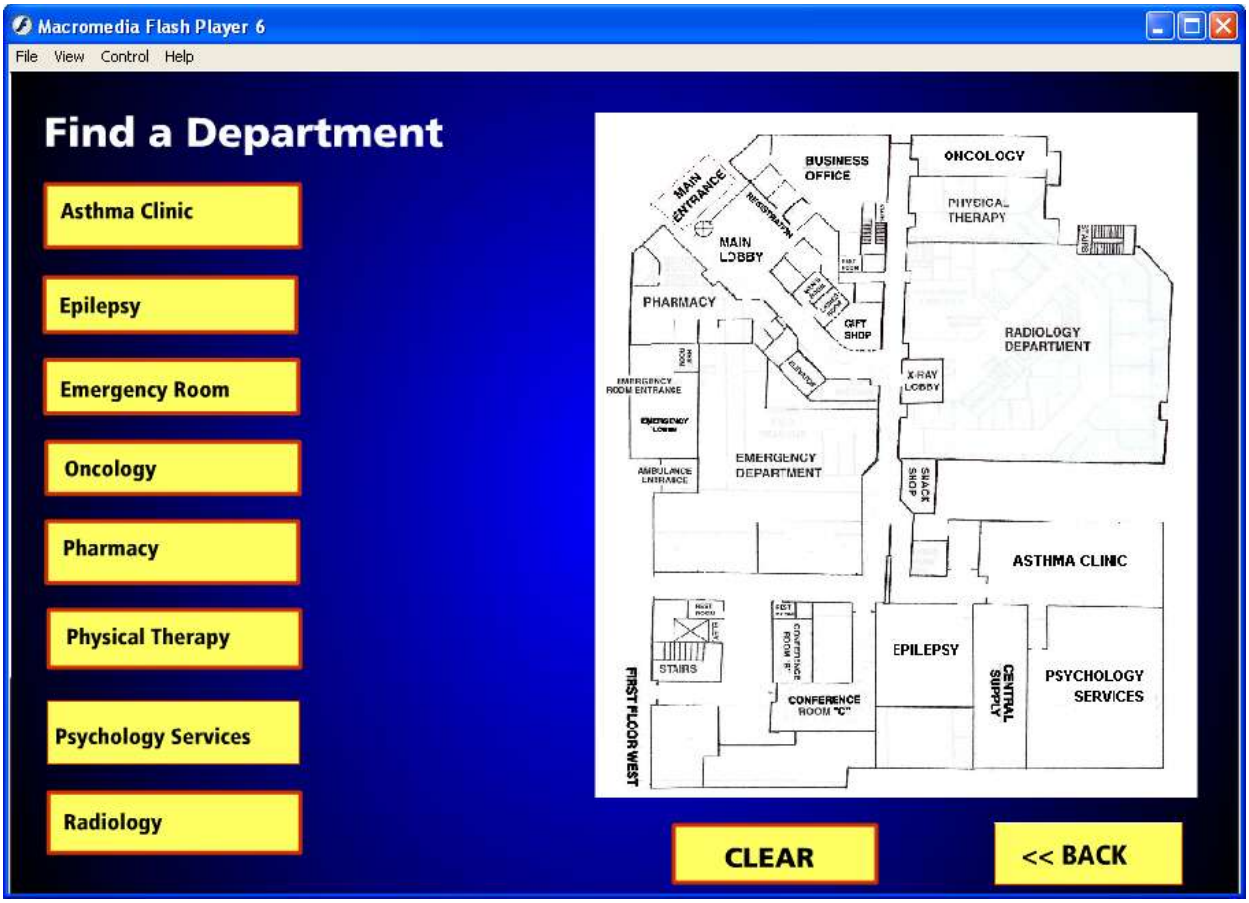
Relationships:
None at this time.

PUI Template for Usability Aspect Report

Study Name: Hospital Lobby Kiosk– Design 1
Date of Study: April 19, 2004
Experimenters' Names: Evangeline Haughney
Subject ID: U2

No. TA-05	**Problem/Good Aspect** Problem
Name: No visibility for where user is in the hospital map	
Reference: Interview notes	
Evidence: U2 offered a design suggestion: "Can you make this more visible on the map, where I am? I didn't know until the arrow came up."	

Explanation:



User selects "Find a Department" and arrives at this page. There is no indication of "You are Here" on the map.

Severity or Benefit:
Severity Level: 3 Minor Problem
Frequency: This will occur every time a user searches for a department.
Persistence: This will impact all users.

Possible solution and/or trade-offs:
Add a "You are Here" orientation graphic that is visible when the page first loads.

Tradeoffs: May add additional clutter.

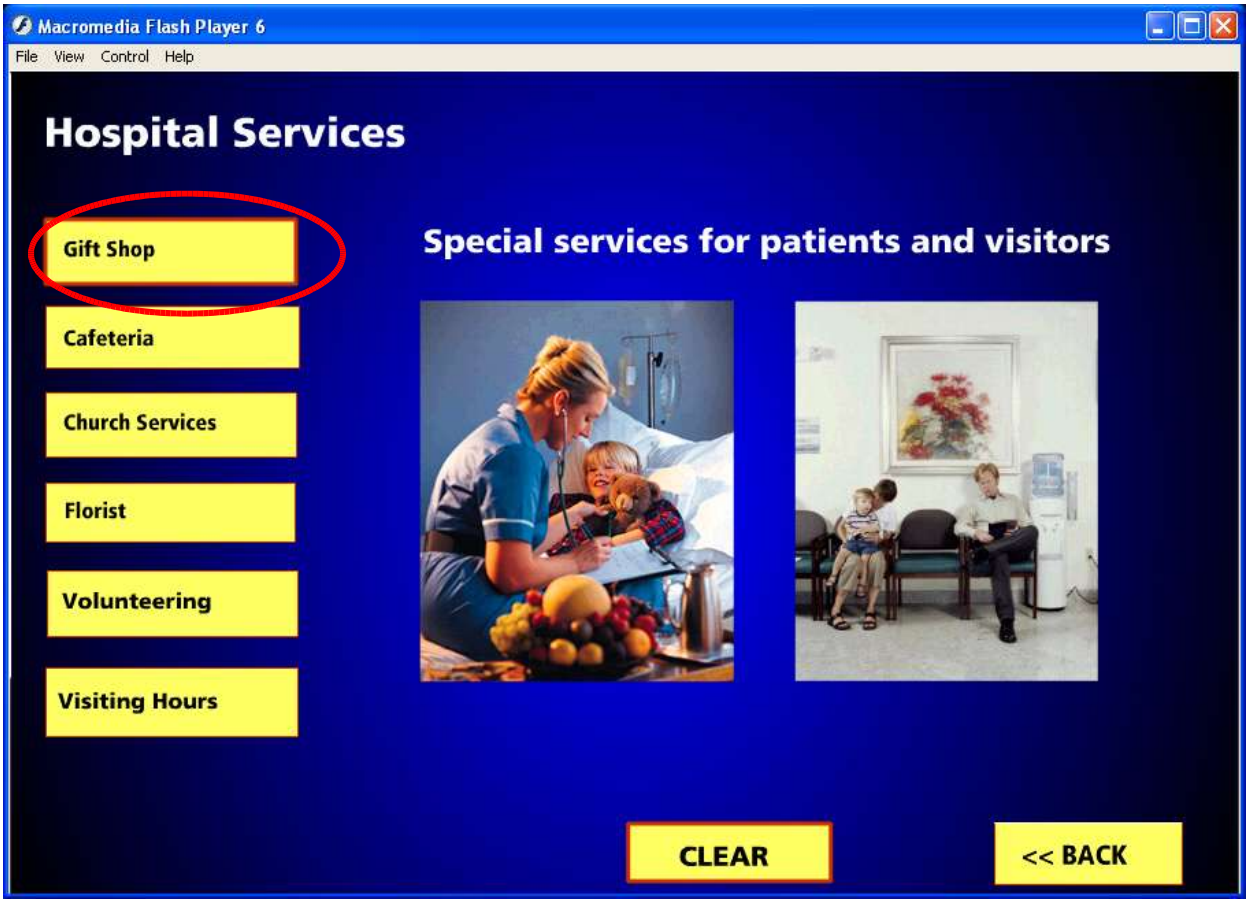
Relationships:
None at this time.

PUI Template for Usability Aspect Report

Study Name: Hospital Lobby Kiosk– Design 1
Date of Study: April 19, 2004
Experimenters' Names: Evangeline Haughney
Subject ID: U2

No. TA-06	**Problem/Good Aspect** Problem
Name: Services listing not alphabetical.	
Reference: Interview notes	
Evidence: U2 asked a question: "Why did you put Gift Shop up top?"	

Explanation:



The services are not listed alphabetically. The user caught an implementation mistake.

Severity or Benefit:
Severity Level: 1: Cosmetic
Frequency: This will affect users whenever they search for hospital services.
Persistence: This will impact all users.

Possible solution and/or trade-offs:
Alphabetize the buttons.

Tradeoffs: None that I can think of.

Relationships:
None at this time.

PUI Template for Usability Aspect Report

Study Name: Hospital Lobby Kiosk– Design 2
Date of Study: April 21, 2004
Experimenters' Names: Evangeline Haughney
Subject ID: U3

No. TA-07	**Problem/Good Aspect** Problem
Name: Update button labels for stressful situations	
Reference: Interview notes	
Evidence: U3 commented "People are nervous, overwhelmed, and anxious (at a hospital)." U3 offered a design suggestion: "What about if you used a question mark symbol?"	
Explanation:	

There are three main buttons on the screen, labeled "Find a Patient", "Hospital Services", and "Find a Department". In Task 1, the user was able to select the correct button "Find a Patient" in under 3 seconds, but they suggested taking the context of the situation and user's cognitive tunneling into account – and make the labels more succinct.

Severity or Benefit:
Severity Level: 3 Minor Problem
Frequency: This will affect users when they first approach the kiosk.
Persistence: This will impact all users.

Possible solution and/or trade-offs:

PUI Template for Usability Aspect Report

Study Name: Hospital Lobby Kiosk– Design 2
Date of Study: April 21, 2004
Experimenters' Names: Evangeline Haughney
Subject ID: U3

No. TA-08	**Problem/Good Aspect** Problem
Name: English button doesn't do anything	
Reference: Interview notes	
Evidence: U3 selected "English" label first, because she "sees that first".	

Explanation:

The user may have a mental model consistent with ATM machines, where you select English, then are prompted to select a choice. In this screen, the system default is English, and the English and Spanish labels caused confusion.

Severity or Benefit:
Severity Level: 3 Minor Problem
Frequency: This will affect users when they first approach the kiosk.
Persistence: This will impact all users.

Possible solution and/or trade-offs:
Change the color of English or remove it so that only Espanol displays.

Tradeoffs: Seeing just "Espanol", users may see this orphan label and find it confusing.

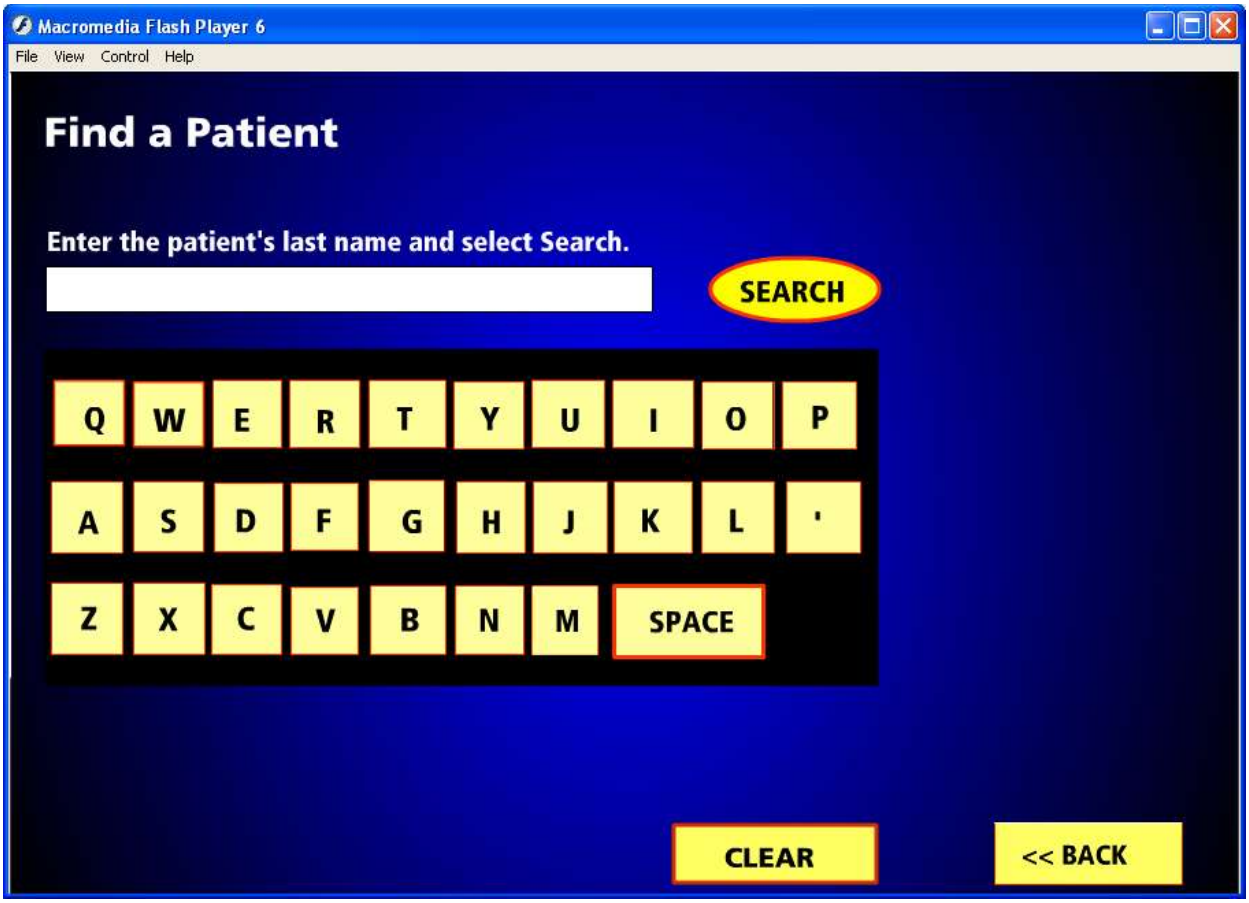
Relationships:
None at this time.

PUI Template for Usability Aspect Report

Study Name: Hospital Lobby Kiosk– Design 2
Date of Study: April 21, 2004
Experimenters' Names: Evangeline Haughney
Subject ID: U3

No. TA-09	**Problem/Good Aspect** Good
Name: Large keyboard buttons are appropriate	
Reference: Interview notes	
Evidence: U3 commented "This is great – it's big…especially for the elderly."	

Explanation:



Keyboard touch screen buttons are available to enter the last name of a patient on the search screen.

Severity or Benefit:
Severity Level: N/A
Frequency: This will affect users when they use the Patient Search.
Persistence: This will impact all users.

Possible solution and/or trade-offs:

N/A – this is a good aspect.

Tradeoffs: Not the standard QWERTY layout and left aligned, this may confuse users, but with a touch –screen kiosk, don't users just poke to type?

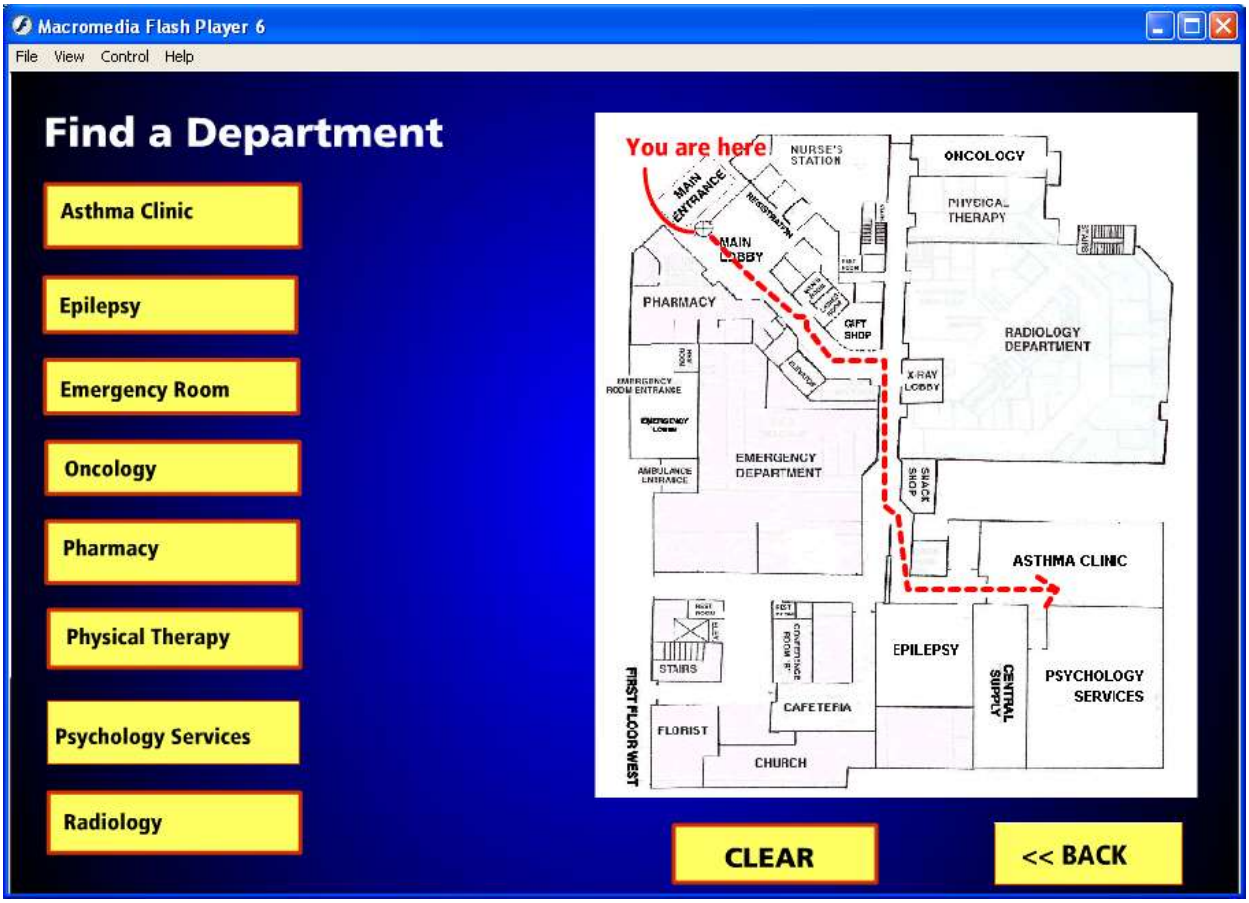
Relationships:
TA-01

PUI Template for Usability Aspect Report

Study Name: Hospital Lobby Kiosk– Design 2
Date of Study: April 21, 2004
Experimenters' Names: Evangeline Haughney
Subject ID: U3, U4

No. TA-10	**Problem/Good Aspect** Good
Name: Map animation appropriate	
Reference: Interview notes	
Evidence: During task 1, U3 commented "I'm geographically impaired, and this is pretty clear. I don't have to take an elevator." During Task 3, U3 commented "It's on the map…I can see where it is." During Task1, U4 commented "Looks like I just follow the main hallway."	

Explanation:



On the Find a Department screen, the user selects a department button and a dotted red path shows them the direction from the main lobby to their destination.

Severity or Benefit:
Severity Level: N/A
Frequency: This will affect users when they use the interactive Department Map.
Persistence: This will impact all users.

Possible solution and/or trade-offs:

N/A – this is a good aspect.

Tradeoffs: The visual difference between the "You are here" solid red line and the dashed "direction path" might confuse users in figuring out where their start and end points are.

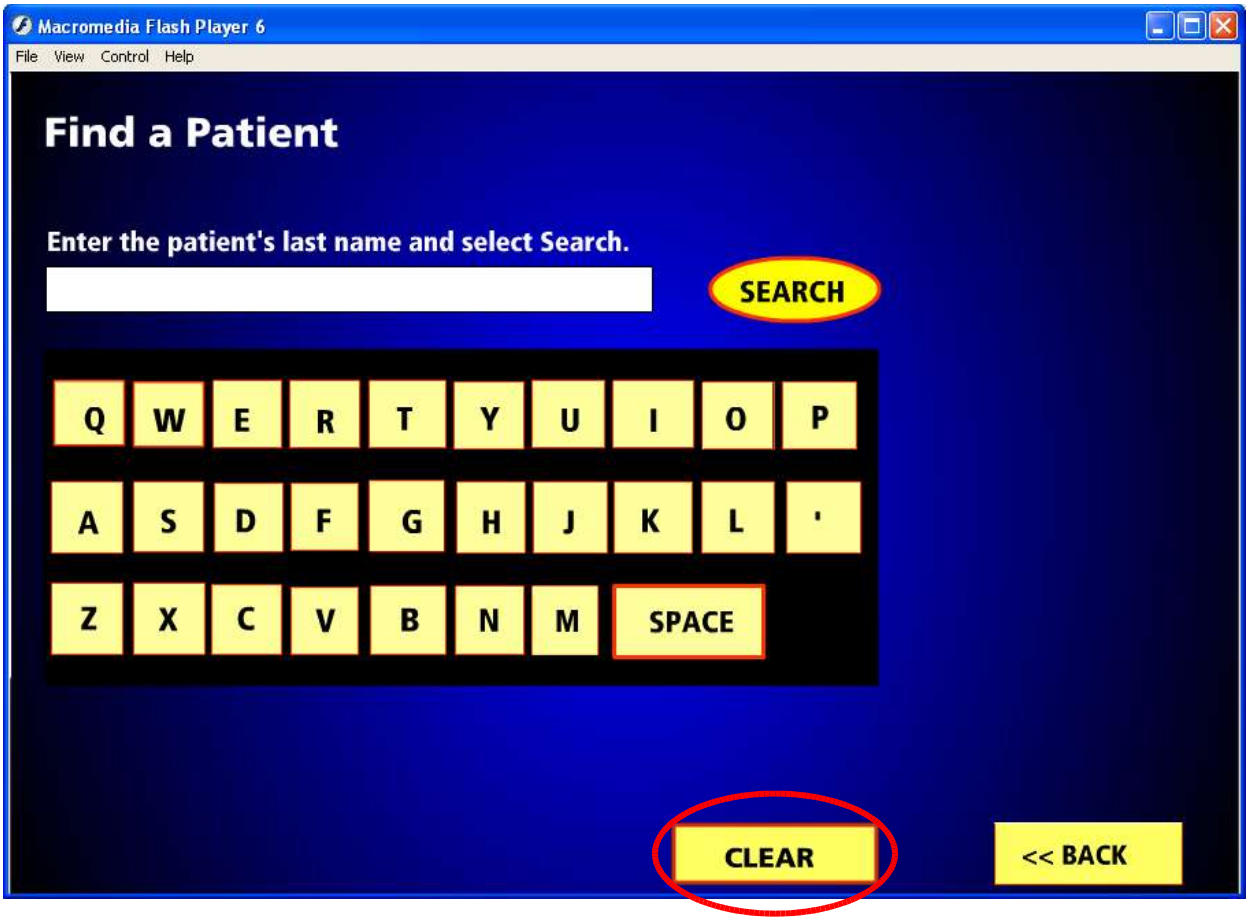
Relationships:
None at this time.

PUI Template for Usability Aspect Report

Study Name: Hospital Lobby Kiosk– Design 2
Date of Study: April 21, 2004
Experimenters' Names: Evangeline Haughney
Subject ID: U5

No. TA-11	**Problem/Good Aspect** Problem
Name: Clear button not immediately visible	
Reference: Interview notes	
Evidence: During Task 1, the user made a mistake in entering the last name Smith. U5 asked "Where is delete?" before locating the clear button.	

Explanation:



Severity or Benefit:
Severity Level: 3 Minor Problem
Frequency: This will affect users when they use the Patient Search.
Persistence: This will impact all users.

Possible solution and/or trade-offs:

Move the Clear button up closer to the keyboard, to the upper right where "delete" key normally is on the keyboard.

Tradeoffs: This would be inconsistent with the rest of the interface.

Relationships:
None at this time.