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Appendix A: Observations

QUESTIONS

How many people use the kiosks? What type of person uses the kiosks? What kinds of tasks are they currently being used for?

METHOD

We observed the kiosks for a total of 9 hours. We observed during different times of the day and on different days of the week. The observer sat about 40 feet away from the kiosk so as not to discourage use. The observer recorded the number of people that approached the kiosk, their gender, approximate age, the item they used (phone, touch screen, or maps), and how long they spent at the kiosk.

RESULTS

The phone was used a total of 26 times over the nine-hour period. The touch screen was successfully used two times during observation. It was touched an additional two times. One person just touched it as they walked by. Another user attempted to use it, however, the cursor was frozen. The maps were used a total of five times throughout our observations.

DISCUSSION

Currently, the phone is the only popular item on the information kiosks. They have a usage rate of almost 3 uses / hour. The maps are somewhat utilized with a rate of .5 / hour. The touch screens are hardly used at all.

There could be a number of explanations for the lack of use of the touch screens. People might have had a bad experience with them in the past and not wanted to use them again. This experience could be similar to the one that was observed—a frozen screen, or it could have been an experience where they couldn't find the information they were looking for. These bad experiences might lead people away from using the touch screens.

The non-use could also be due to people not noticing the touch screens. However, this is less likely because the phones are highly utilized, so people do notice the kiosks. It is unlikely that they only notice the phone and not the touch screen.

People might not use the touch screens because they don't have the need to get any of the information that is provided. These people are knowledgeable about the Media Union and don't have any questions regarding "people, places, or things." It could be that people who do have these questions see the information desk directly behind two of the kiosks. They prefer to direct their questions to a person, rather than trying to find the information on the kiosk.

Appendix A: Observations

MEDIA UNION INFORMATION KIOSK OBSERVATION

Observer _____

Date/Time _____

Which kiosk _____

#	Gender	Est. Age	Est. "title"*	TIME IN	TIME OUT	TOTAL TIME	Item Used**	Clueless Rating***
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								

* Student, Faculty, Campus Visitor, etc.

** Touch-screen, phone, or maps

*** Clueless Rating: 1—Totally lost; 2—Somewhat experienced 3--Expert

Appendix B: Competitive Analysis

Objectives

Our primary goal was to observe a wide range of kiosks and analyze their usability, usefulness, aesthetics. We were also looking for interesting features that could be implemented in future versions of the Media Union Kiosk (MUK). By observing kiosks in the field we hope to gain a clearer understanding of what makes a usable and functional kiosk. This will aid us in evaluating our subject and allow us to make recommendations to the design team.

Methods

The team observed five kiosks ranging from static informational displays to fully interactive, touch-screen installations. Each kiosk was analyzed for a minimum of one half hour during a period of peak usage. We used the same forms from our observations of the MUK to collect usage statistics (see observation section). Each team member then wrote a summary outlining the advantages, disadvantages, and key features of the kiosk.

Observations

Briarwood Mall Information Kiosk

Observer: SH

Date/Time: 2/17/02; 2:15-2:45pm

Number of users: 9

In the Briarwood mall there are five three-sided, static display information kiosks. They are not located within sight of the information booth. There is a person at the information booth—there is only one information booth at the center of the mall. There are ads for things such as movies or stores on two sides of the directories. On the third side there is a map. At the top of the map there is a visual map of the entire mall. The actual store names are written on this part of the map. The map is sectioned off in different blocks A-J. Below the map there is a listing of store types—such as men's apparel or shoes. Under each of these categories is a list of the corresponding store and the letter of the location of that store. This organization scheme is not exclusive—stores can appear in multiple categories. The map also contains icons for things such as restroom or information center. Underneath the map is a key for the icons.



Purpose: Provide way finding for mall visitors and sell add space for mall stores.

Advantages: Large, easy to read static maps

Disadvantages: Dislocated from attended information desk.

Appendix B: Competitive Analysis

UM Lurie Building Events Display

Observer: TV

Date/Time: 3/5/02 1:00 – 1:45 PM

Number of users: 0

This kiosk is a non-interactive list of Engineering School events on an 18” flat screen monitor. It is located at eye-level on the information desk in the lobby and faces the main entrance. Although this lobby sees a high level of traffic, the kiosk receives very little use. During the observation period 46 people walked by the screen and none of them even gave it a look. Three of those visitors asked the attendant at the desk for assistance. There is nothing unique about this kiosk in physical appearance or content. For all visitors know, this could just be the attendants computer monitor turned outward. Although it is up-to-date, the content is primarily text-based and only changes once every few minutes. This kiosk, like the MUK, proves a simple point: building and installing a kiosk does not guarantee that people will use it. Additionally, this kiosk also shows that when given the choice, people will talk to a human being rather than view a screen-based application.

Purpose: Provide general event information to visitors.

Advantages: Well located.

Disadvantages: Content and physical design are not visually engaging.

UM Business School Information Kiosk

Observer: SS

Date/Time: 3/7/02 5:30 – 6:30 PM

Number of users: 4



There are five kiosks within the compounds of the University of Michigan Business School. I observed the one located at the entrance by East University beside the Executive Residence. The design of the kiosks is sleek and attractive. They are slim and waist length in height with the display screens tilted back. The design is eye catching. During my observation I noticed that people actually look at the kiosks and recognize it as an object when they pass by.

The business school kiosks have much more content and are more interactive than the Media Union Kiosk. On the display screen there is a right menu which is divided into five categories – Faculty and Staff directory, Today @ the Business School, Executive Education Seminars, Maps of the Business School, and List of the Business School’s facilities. The animation and graphics used are far more compelling than the Media Union Kiosks. The organization of the faculty

Appendix B: Competitive Analysis

and staff directory is similar to the Media Union Kiosks in the sense that they both employ an alphabetical organization. However, the difference lies in the fact that there is a link to a map of the office location of the faculty/staff searched. The Media Union Kiosks also provide maps, but they are not linked to the specific office locations of the faculty/staff. Within the list of the Business School's facilities there are links for viewing some of the facilities in 3D.

Purpose: Provide information about school. Assist visitors in finding their way through school.

Advantages: Eye-catching design. Compelling content.

Disadvantages: Some kiosks are difficult to find

Borders Title Sleuth (Liberty St. in Ann Arbor)

Observer: TM

Date/Time: 2/27/02 8-9 PM and 3/3/02 3-4 PM

Number of users: 8

Borders has three interactive kiosks that use a keyboard and mouse for input. The interface is a Web site using frames with a left side frame for search and navigation choices and a larger right side for results. Three dividers separate the left frame into areas: Search, Borders Hot Lists and Recommendations. Within each divided area are pull down lists with headers, such as Look for [Books] [Music] [Movies] [All]. Users must click on "Go" after they've made their selections.



After go is clicked, the screen takes an average of five seconds to load. When it does come up it provides an image of the book, title, author and price. Beneath the selection of books are three choices: "Find It," "Print It" and "Check other stores."

The interface is dynamic enough that its initial content changed between my two visits. Two kiosks are located downstairs, one in the fiction area—a lower traffic area, one by the stairs. The one by the stairs appears newer with its name "Title Sleuth" painted into the plastic of the display. The other two have cardboard signs above them that say "Title Sleuth." Each is proximally distant from the Border's information desks.

First observation: Done during the University of Michigan's spring break. There were only three users. There was only one who spent more than two minutes. This user seemed vaguely frustrated as she kept shaking her head. However, she stayed for a little less than five minutes and then seemed to resume her search by physically looking in the same area for a book.

Second observation: More heavy traffic, but only five users. None stayed longer than two minutes. It wasn't clear that any found success in what they were searching for. With one user, there was again a lot of head shaking, back and forth.

Purpose: Sell merchandise, complement information desk staff and promote Borders brand identity.

Appendix B: Competitive Analysis

Advantages:

- A fast search engine that is keyword search enabled.
- Keyboard and mouse more familiar than touch-screen.
- Highly graphical with images matching advertising campaign.
- Networked: Able to find out if items are available at other stores.
- Content easily updated.
- Little interference with information desk.
- Offers internal links. Ex. Search for Woody Allen as author also brought up music and movies.

Disadvantages:

- Printer difficult to find and did not work.
- Hard to find help when it doesn't work.
- Order requests require user to print it out and take it to the info desk.
- Slow to switch between screens. Queries take a long time.

Target Gift Registry Kiosk

Observer: TM

Date/Time:

Number of users:



The Target interactive kiosk is a highly graphical interface, available for registering for desired items for baby and wedding showers. It uses a touch screen display and is networked to other Target stores, as well as to other Marshall Field chain stores. It uses a non-qwerty, alphabetical entry point to enter the first two letters of a last name and a location.

Once a shopper finds the registry, the customer may print out the bar-coded list of desired items. If items are purchased, the cashier scans the barcode for the list item and the registry changes for the next customer. For example, If one purchases a Playtex 60 count , 8 ounce drop in, and it is scanned, the item will appear grayed out and be marked received for the next customer printing out the list.

Purpose: To sell merchandise, relieve staff of registry tasks, and to sell Target's brand image.

Advantages:

- Easy to learn—so good for novice users
- Target audience well-defined
- Fast—Immediately reacts when selection touched.
- Highly functional with specific descriptions provided
- Print out afterward with list of items and contact information for assistance
- Graphics match company logo and advertising campaign.
- Two locations right at the front of the store.

Appendix B: Competitive Analysis

Disadvantages:

- Difficult to use non-quiry layout to enter names.
- Uses abbreviations for items rather than writing them out. May be confusing. Ex. Name: 4 in 1, description: Evnfl comft pls nvy/wh, Evenflo
- Assumes everything person wants is at Target in Target predetermined brands, quantities, prices.

Conclusions

Based on our observations, people will approach kiosks when they need information, are curious about the object, or both. However, if the following design criteria are not met, the kiosk will experience a low rate of return visitors:

- Well placed and visually appealing. This will attract initial visitors.
- Compelling and useful content. People must find the information they are seeking.
- Information must be delivered in a timely manner. If not, visitors will find other sources for the information, usually with a live person.
- The functional elements such as screen, input device, physical casing, and printer (if available) must all work well together.
- The information architecture and graphical interface must be clear and easy to learn.

Appendix C: Literature Search

Objective

We wanted to find out what research had previously been done on information kiosks. We felt that a sound appraisal of the current literature on information kiosks would expose us to the important issues concerning them. This in turn would make us better prepared in formulating our survey, usability test and coming up with recommendations.

We wanted to know about the typical features of an information kiosk, their implementation, design considerations, developments in touch screen displays and interactive maps, and case studies of kiosk usage.

Methods

In order to answer the questions we posed, we referred to proceedings from conferences such as Computer Human Interaction (CHI) and articles from journals related to Human Computer Interaction. Additionally we examined the websites of professional organizations such as the Association of Computing Machinery's Special Interest Group on Computer Human Interaction (<http://www.acm.org/sigchi/>).

Findings

Slack & Rowley (2002) state that the following forces drive new kiosk design feature sets:

1. Tasks or Functions: Kiosks must provide more interactive and transactional services.
2. Information sources: Web pages and longer pages with more content.
3. Technology: Internet connectivity, email communication, real-time services.
4. User: Users are now typically more comfortable with the look and feel of Web based services.
5. Physical Appearance: No longer consigned to the corner, kiosks must be physically well designed and engaging.

To implement these features in any kiosk located in a highly public, high traffic circulation space, input devices such as alphanumeric keyboards, cursors, and touch screens are needed (Van Kampen, 2001). Alphanumeric keyboards can be standard mechanical, membrane or elastomer-based. While they can be sealed, they are all subject to vandalism by sharp objects. Cursors can be trackballs, pointing sticks or touch pads. Trackballs provide more advantages than the other two since they are more recognizable and usable. However, trackballs can be difficult to mount and use on vertical surfaces. Touch screens can use SAW sensing, capacitive sensing, or resistive sensing. SAW sensing provides high accuracy, capacitive sensing is fast and sensitive, and resistive sensing is scratch resistant. However, water droplets or other objects activate the cursor in SAW sensing, and capacitive and resistive sensing provide lower CRT brightness.

Currently new and improved designs are being implemented for information kiosks. Christian & Avery (2000) compare a "Vision kiosk", which combines machine vision to

Appendix C: Literature Search

locate and track people in the vicinity with an animated talking head that focuses on clients and talks to them, to an "Agent kiosk" – a kiosk that uses infrared and sonar sensors to sense clients and multiple interacting on-screen agents to communicate with the client. Their findings are as follows:

1. The quality of the content on the kiosk strongly influences the client's evaluation of the quality of the technology i.e. "Content is King!"
2. People are attracted to an animated face that watches them.
3. Small mobile on screen agents interact better with kiosk content than a single fixed face.
4. Speech recognition has not yet proven to be useful in a kiosk, except in limited circumstances.

In terms of touch screen displays Potter, Weldon & Schneiderman (1988) list some of their advantages and disadvantages. The advantages of touch screens are that they are easy to learn, they save space because no mouse, keyboard etc. is needed and they are durable. The disadvantages are high error rates, imprecision, and fatigue in the arm. To improve upon the disadvantages, the best strategy in choosing an element on the touch screen from a group of elements is to have the cursor appear when the user first touches the screen and have it follow the user's touches. When the user likes an element, they remove their finger once their cursor is over it.

Sears, Kochavy & Schneiderman (2000) compare different types of touch screens. QWERTY displays the standard keyboard setup onscreen, Alphabetic displays the letters A-Z in order, and Reduced Input Data Entry (RIDE) lists all letters... user clicks... then lists two letter combinations... user clicks... it will keep drilling down until everything can be displayed on one screen. In terms of speed QWERTY comes first followed by RIDE and Alphabetic. In terms of errors, RIDE is the least error prone. The researchers concluded that RIDE is better when there are a limited number of inputs, values are unique, and the values are long.

Landauer & Nachbar (1985) found that both Hick-Hyman and Fitts' laws apply to touch screens and choosing an option from a menu. Their study had subjects choose a goal item from a hierarchy of menu items that were displayed on a touch screen. The reaction times plotted as a function of number of alternatives support both Hick-Hyman and Fitts' law (the size of the target depended on the number and size of targets on the screen). The results also show that it is better to have a shorter menu tree. The subjects were faster at reaching the goal when there were more alternatives per screen and fewer screens to move through rather than fewer alternatives per screen and more screens to move through.

In terms of interactive maps, improvement in speech and pen recognition have developed in parallel with visual display and database access capabilities to yield more broadly functional maps. Sharon Oviatt (1996) in her study found that in comparison with speech-only input to a map, combined use of pen and voice actually was faster, less error-prone, and input involved less complex linguistic expressions to be recognized and parsed. Furthermore, this constellation of performance advantages was matched by a strong user preference to interact multimodally with maps. She states that in large part, the error-prone, slow, disfluent, and

Appendix C: Literature Search

generally unacceptable nature of speech-only input to maps can be traced directly to people's difficulty articulating spatially-oriented descriptions.

There have been numerous case studies on innovative kiosk features. The Alamo Kiosk at LAX airport has a credit card slot for transactions. The I + Tourist kiosk in London plays low-volume music when not in use, has an interactive map that guides tourists through directions with landmark photos, and has a small printer for printing maps and directions. The CENTERLINQ kiosk in Beverly Center, LA. has connectivity with commercial services such as printed coupons for stores and applying for an Amex card. It also supports credit card transactions. The BT multiphone at Piccadilly station (Manchester, England) has news, email, internet etc. integrated with phone and the WAMWorld kiosk at Heathrow Airport, London has a keyboard shelf that allows users to place purse, bag, etc. during use. The touch screen kiosk for the Minnesota Landmark Center has an attractive graphical interface, advanced animation, video and audio, a floor-by-floor tour, an updateable calendar of events, directions to the nearest restrooms, and the ability to "virtually" tour any of Center's exhibits. Everland Entertainment's "Kid City" kiosks have a surface wave touch screen, high quality light transmission, questions with button answers to choose (e.g. "What would you like to hear?" Two pink buttons: "Artists," "Topics"), touchable pictures of artists with their names, individual album graphics and 25 seconds of artists' songs.

Silverstein & Prescott (1998) illustrate a case study where a project involving deployment of kiosks for government services was discontinued. They report that the project, known as the Pennsylvania Kiosk Project, was discontinued because of a dramatic decline in public usage, a loss of enthusiasm among participating agencies, and the emergence of the Internet. Their stated 'lessons learned' are not to use a given technology for the sake of using that given technology, conduct a needs assessment at the outset of the project, it is difficult for projects to simultaneously focus on multiple, competing goals, it can be costly and inefficient to implement a kiosk system on a statewide basis, location is critical, functionality is critical, project outreach must be conducted on an ongoing basis, the cost of developing software segments needs to be defined in a manner that is equitable to both contractors and the government entity, and pay attention to emerging technologies.

Looking into case studies on accessibility issues in information kiosks, Vanderheiden & Law (2000) report the use of a hybrid interface for information and transaction touch screen kiosks developed for individuals with low vision and blindness. Two key features were provided: a description of the overall layout of the screen, and a mode where individuals could touch any text on the screen and have it read without activating the button. The approach was found to work well with low vision individuals, but was more difficult for those who were blind, possibly linked to spatial orientation. Techniques developed in this study are now being used in airports, libraries and other community centers.

Appendix C: Literature Search

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Appendix D: User Survey

QUESTIONS

We used a survey tool to gather general data about potential Media Union kiosk users. Our goals were to find out demographic data about Media Union traffic in the main kiosk areas, to find out usage rates among users and to find out what potential users felt was the purpose of the kiosks. We also sought information on prior users' experience and solicited users for their ideas on the existing strengths of the kiosks and areas for improvement. Our usability study user set was drawn from survey respondents who indicated a willingness to be interviewed.

METHODS

Our double-sided draft [Appendix A] passed through a couple private and then group revision stages before we arrived at a finalized set of questions and format.

One member of our group used the Media Union's GroundWorks facility to create a large, laminated sign, saying, "Hungry? Two-minute survey = Candy Bar, You do the math." He also sought and obtained a table and permission to conduct the survey from media union assistant director Glenda Radine.

Members of our group set up the table at three different times--a weekday noontime, a weekday evening and a weekend afternoon--by one of the kiosks in the entryway to the Media Union—a highly trafficked area. Miniature size candy bars were provided for those who took the time to fill out the survey.

A total of 68 surveys were completed in this time. Quantitative data was compiled using an Excel spreadsheet and appropriate statistical methods (means, medians, percentages) for analysis. This data was then placed onto a modified version of the survey for easier access. Textual feedback also was processed and is provided on the following six pages.

RESULTS

Demographics Summary: The average person surveyed was a 21 year old male engineering student.

The median age of the 68 who responded was 21 years with a mean of 23. 58 percent of those surveyed were male and 38 percent were female. 92 percent were students and 8 percent were staff. No faculty members filled out the survey.

Only 27 of 68 wrote in the program they are involved with. Of these 70 percent were engineers, accompanied by a negligible number of participants from the School of Information, Architecture, LS&A and the School of Social Work.

Usage: Fewer than 2 out of 5 surveyed had used the kiosks previously. Of those who had used the kiosk, most used the downstairs version and reported medium high satisfaction with

Appendix D: User Survey

their experience. They didn't feel the kiosk was either easy or hard to use, with a median response falling right in the middle. About 2 out of 5 users reported using the kiosk to find a Media Union Map or for more information on the Media Union.

Only 38 percent of those surveyed had used the kiosks previously. Median usage for these 26 respondents was 2 times. (The mean is 9.92, but is driven out of proportion by one user who marked that he had used the kiosk 200 times.) On a scale of 1-5 the users mean satisfaction rate is 3.27. The ease of use mean factor landed right in the middle at 2.5 with 5 being hard.

69 percent of users had used the downstairs kiosk, with 15 percent using the upstairs kiosk and 12 percent having used both. (One respondent marked neither.)

In a checklist for what the kiosk has been used for, 42 percent of those surveyed checked "To find a map of the Media Union," and 42 percent also checked "To find out more information on the Media Union." Two other choices could be seen as a subset of "more information on the Media Union": 35 percent checked "To locate a person or office" and 23 percent checked "To find out how to use Media Union services." Only one person (4 percent) checked "To find out about Media Union/North Campus events."

Six users wrote in responses. Three wrote in using the kiosk out of curiosity; two for the phone; and one person, seemingly sarcastically, for a stapler.

Purpose: In a second checklist surveying all 68 respondents, more than three out of five people checked finding a University map as a useful kiosk feature. More than half of the respondents selected information for Media Union services and also more than half selected e-mail.

62 percent selected "To find a map of the University," followed by 57 percent for "e-mail" and 56 percent for "To find out how to use Media Union services." Half (50 percent) selected "To find out about North Campus events" and 46 percent chose "to surf the Web."

Less popular items were: "To find out more information about the University" at 37 percent; "To view interactive videos" at 35 percent; and "To watch U-M TV" at 22 percent.

Seven people wrote in services they would find useful: Three mentioned the phone. Other write-ins were MTV; news, sports and scores; and student info. One respondent wrote in "none."

Physical format: Users did not seem to strongly come out in favor of physical format changes. 57 percent said "No" to the question of switching to a mouse. Only 55 percent would prefer to be able to sit down. 60 percent said they would like a log in and tailored view.

Strengths/Improvements for the kiosks: Thirty people responded with what they "like about the kiosks." Twenty-seven people offered suggestions.

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Location: Five people commented upon location with three saying the location is a strength and two asking for location changes. Four people saw accessibility as a plus and four said that they hadn't noticed the kiosks before.

Other physical aspects: Three people saw the height as a problem, either too low or too high. Two people asked for seating. One person asked for screens on other sides and one asked for an additional phone with directory assistance.

General positives: Seven respondents reported ease of use as a positive feature. Five people mentioned the informative aspects including for finding people, for getting information on the Media Union and for finding the way around North Campus. Five people remarked upon the touch screen and three praised the appearance. Three commented positively about the speed. (These could be seen to overlap with the four accessibility comments.)

General improvement: Seven people surveyed asked for more information aspects ranging from more information on Media Union facilities to transportation information requests to videos, sound and music. Three people noted organization and navigation aspects, including a request for a back arrow. An additional respondent asked for instructions for use. Two people made requests for improvements to the maps.

Interviews: 13 people wrote in their e-mail address stating a willingness to be interviewed.

Appendix D: User Survey

User survey findings:

Total respondents = 68

We are a School of Information group evaluating the usability of the kiosks located in the Media Union. Your assistance in filling out this survey will play a large role in determining our recommendations. All information gathered in this survey will be kept confidential.

Age Mean 23, Median 21 *Non-responder thrown out

Gender 42% (27) Female 58% (38) Male

Role 92% (60) Student 8% (5) Staff (0) Faculty

*3 non-respondents not calculated in percent

Programs (of those who wrote in)

9 Electrical Engineering/Computer Science

5 Civil Engineering

3 Aerospace Engineering

1 Industrial and Operations Engineering

1 Mechanical Engineering

19 Total Engineering

3 Architecture

2 School of Information

2 LS&A

1 Social Work

Have you ever used the kiosk? 38% (26) Yes 62% (42) No

If yes: (Numbers calculated based on 26 respondents who had used before)

How many times have you used the Media Union kiosk?

Mean 9.92 **Median** 2 *One outlier marked 200. This drove the mean up.

How would you rate your experience on a scale of 1-5?

Dissatisfied

Satisfied

1 2 3 **X** 4 5

[3.27=Mean]

[3.5=Median]

Appendix D: User Survey

How easy is it to use the kiosks?

Easy

Hard

1 2 **X** 3 4 5

[2.5=Mean]

[2=Median]

Have you used the upstairs or downstairs kiosk or both. (circle one)

15%(4) Upstairs **69% (18)** Downstairs

11.5% (3) Both **4% (1)** Neither (?)

What have you used the kiosk for? (check all that apply)

42% (11) To find a map of the Media Union

42% (11) To find more information on the Media Union

35% (9) To locate a person or office

23% (6) To find out how to use Media Union services

4% (1) To find out about Media Union/North Campus events

23% (6) Other

1. To use the phone
2. Phone
3. To find out what is it inside the kiosk
4. Curiosity
5. Fooling around.
6. Stapler

What services would you find useful on the kiosk (percents taken out of 68)

62% (42) To find a map of the University

37% (25) To find more information about the University

56% (38) To find out how to use Media Union services

50% (34) To find out about North Campus events

35% (24) To view interactive videos

22% (15) To watch U-M TV

57% (39) For e-mail

46% (31) To surf the Web

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- 10% (7) Other
- 1-3. phone
 4. MTV
 5. News, sports and scores
 6. Student Info
 7. None

Would you prefer using a mouse to the touch screen display?

39% (26) YES 57% (38) NO

*1 person marked choice and 1 left blank, total out of 67.

Would you prefer to be able to sit down to use the kiosk?

55% (37) YES 43% (29) NO

*1 person said maybe and 1 left blank, total out of 67.

Would you like the kiosk to be able to log in and receive a tailored view of the kiosk with information specific to your needs?

60% (37) YES 40% (25) NO

*6 blanks were left, total taken out of 62.

What do you like about the kiosks?

- Informative
- Its accessibility and info
- Touch screen easy
- Information, on cab rides, etc . . .
- touch screen
- It is handy
- It's fast
- Ease of use
- The fact that it gives info about Media Union
- Easy to use
- Easy to use
- Potential
- Easy
- Easy to use
- 24-hour service
- Only used them once. Like being able to find people.
- Quick to use. No need to login
- Location in the Media Union. The touch screen interface
- Information is easy to see and access.

Appendix D: User Survey

--The idea of having an information center for finding your way around North Campus

- Easy to see.
- The touch screen
- The pyramid top with perforations & the touch screens
- The ability to call people
- They look nice
- They look cool
- Good info, accessible
- Prompt, location
- Looks like easy access
- Easy access

What would you improve about the kiosks?

- nothing
- More info about Media Union facilities
- 1. More interesting information like videos, sounds, music, animation, etc . . . Not sure how you can incorporate that w/the Media Union theme though. 2. Downstairs kiosks are a weird height. It's like I need to kneel to use it. It's not at my eye level, and I'm not really that tall anyway.
- Transportation--Busing schedules, more campus program dates
- Height. I'm 6'2" and I have to stoop to use it
- Maybe have more options, information
- Organize it better
- More functionalities
- Have another phone and directory assistance
- More instructions on how to use it
- Chair
- Make them work, touch seldom works
- It is hard to navigate
- Placement shouldn't be in center.
- Make them more known to the public and more interactive.
- The maps are confusing.
- Make them have more information.
- There needs to be a back key or arrow so you can go back to the previous page. I think that a history of this building & North Campus would be interesting.
- More prominent location.
- Make more screens on other sides.
- Map of campus
- This is my 2nd semester on N.C. & I just now noticed them. I have been starving for info though. Maps, CAEN info, class schedules & locations, etc . . . So, if they even had that information, I wouldn't have accessed it. They need to stand out more.
- More information about U-M people (directory, ability & e-mail)
- Make them more visible & viewable

Appendix D: User Survey

- Make them more noticeable
- I would put something useful for students. Perhaps have two modes of operation-
student and visitor.
- The location of the screen, too low. Their location seems to be in a space
characterized by motion.
- Align them to the walls. They don't look good at the center of the floor
- Availability
- Seating

Willing to be interviewed.

nsharma @umich.edu
dperpich @umich.edu
nkpatel @umich.edu
bkahl @engin.umich.edu
psupanwa @umich.edu
sshephar @umich.edu
sburch @engine.umich.edu
ilovedsp @hotmail.com
admytren @umich.edu
Elbarriobox @hotmail.com
moemoe-esco @excite.com
cfrankli @umich.edu
Kiago@umich.edu

Appendix D: User Survey

Survey questionnaire:

Media Union Kiosk/User Survey

We are a School of Information group evaluating the usability of the kiosks located in the Media Union. Your assistance in filling out this survey will play a large role in determining our recommendations. All information gathered in this survey will be kept confidential.

Age _____ Gender (circle one) Female Male

Role Student Staff Faculty Program _____

Have you ever used the kiosk? _____ Yes _____ No

If yes:

How many times have you used the Media Union kiosk? _____

How would you rate your experience on a scale of 1-5? (circle one)

Dissatisfied Satisfied

1 2 3 4 5

How easy is it to use the kiosks?

Easy Hard

1 2 3 4 5

Have you used the upstairs or downstairs kiosk or both. (circle one)

Upstairs Downstairs Both Neither

What have you used the kiosk for? (check all that apply)

_____ To find a map of the Media Union

_____ To find more information on the Media Union

_____ To locate a person or office

_____ To find out how to use Media Union services

_____ To find out about Media Union/North Campus events

_____ Other (fill in) _____

PLEASE TURN OVER

Appendix D: User Survey

What services would you find useful on the kiosk (check all that apply)

- To find a map of the University
- To find more information about the University
- To find out how to use Media Union services
- To find out about North Campus events
- To view interactive videos
- To watch U-M TV
- For e-mail
- To surf the Web
- Other (fill in) _____

Would you prefer using a mouse to the touch screen display? YES NO

Would you prefer to be able to sit down to use the kiosk? YES NO

Would you like the kiosk to be able to log in and receive a tailored view of the kiosk with information specific to your needs? YES NO

What do you like about the kiosks?

What would you improve about the kiosks?

Would you be willing to be interviewed? YES NO

If yes, please include your e-mail address here _____

Thanks for your time!

Appendix E: Generalized Transition Network (GTN)

QUESTIONS

The designer should understand the architecture of the information on the kiosk and the effect that this structure has on the user. What is the current structure of the information on the kiosk? Is the structure consistent across the displayed screens? Are there ways that this structure can be improved?

METHODS

The information kiosk uses html pages to display the information. However, the user at the kiosk does not have the navigational tools on the kiosk that they do on a browser (e.g. back, forward, home). We obtained copies of the pages so we could examine the structure of the information that is currently on the site. We developed a Generalized Transition Network (GTN) to examine the different states, or screens, of the system and what actions the user performs to move between these states.

RESULTS

As can be seen from the GTN diagram the information the designers choose to favor breadth rather than depth in structuring the pages. The user does not have to travel through many screens to get to the information they are looking for.

The user also has the capability to get to members of the first and second level of the hierarchy from each of the pages on the kiosk through the consistent use of the navigational elements. The top level of the hierarchy is the main page that contains links to the three pages in the second level—People, Places, and Things. The user also has the means to get the ‘maps’ page from most of the pages on the site. Screens that are in the second level of the hierarchy contain links down to the third level. The screens in the third level contain links down to the fourth level, which is the last level. Screen in the last level contain links back up to the third level screen that is their parent.

The maps section is not really a ‘child’ of any of the three main pages—People, Places or Things, however, when you get down to the lowest level in the maps page, the navigational description categorizes it as a Thing. For instance, it says: THINGS: *Building Maps*: Lower Level. Building Maps is the only thing that can be touched. It will bring the user back to the maps page.

There is only one inconsistency in the hierarchy. The “Groundworks” screen is the linked from the “PLACES” screen, a member of the second level of the hierarchy. However, it is also linked from the “LABS & STUDIOS” screen, a member of the third level of the hierarchy. So this screen is sort of a member of both the third and fourth levels of the hierarchy. However, it “behaves” like a member of the fourth level because it has a link back to its parent on the third level. Even when the user clicks on the page from the second level, it still contains a link to its parent on the third level.

Appendix E: Generalized Transition Network (GTN)

DISCUSSION

According to Landauer et. al (1985) it is better for touch screen menus to have a hierarchy that favors breadth over depth so users do not have to navigate a large number of levels. In touch screens there is often a delay in the time it takes the page to change after the user touches on their selection. It is more cumbersome for the user to perform a large number of selections choosing from a few options, rather than having to choose from a large number of options and make a few selections. The information on the MU kiosks is structured so that users do not have to make a large number of selections to reach the final level in the hierarchy, which is beneficial according to Landauer et. al.

Considering that the navigation of any hierarchy of information is awkward, especially using a touch screen, it is very important that there are the navigational elements on each page. This is also important considering the fact that there should be multiple users, one right after the other, at an information kiosk. Once a user finds the information they are looking for, they are likely to leave the screen deep in the information hierarchy. It is important that the next user has the ability to easily get back to the top of the hierarchy without having to travel the entire path. It is obvious that the designers felt that although the map section is not a member of the second level of the hierarchy, it is one of the most important pages because a link to this page was included on every other page on the kiosk.

At every level in the hierarchy the user is able to reach the parent from the child. In the second and third level of the hierarchy this is achieved by clicking on the navigational elements that are on every screen. Shapes in the GTN represent these elements. In the fourth level of the hierarchy there is a link to the parent of that screen, as well as the screens in the first and second levels of the hierarchy. The links to the parents are represented in the diagram by the double-headed arrows.

There is only one inconsistency in the navigation of screens of the kiosk. The designers must have thought that Groundworks was an important thing to include under both “Places” and “Labs & Studios.” It is not confusing if the user reaches this screen through the “Labs & Studios” screen. However, it is confusing if they reach it from the “Places” screen because the navigational element indicates to the user that they are in the hierarchy under “Labs & Studios.” The designers may have thought that if someone was looking for “Groundworks”, they might not look under “Labs & Studios”, so they decided to include it at both places in the hierarchy.

Overall, the information and screens on the Media Union information kiosks are well structured. It is a shallow hierarchy that is relatively easy to navigate through. The use of navigational elements enables the user to reach information relatively quickly even after they are in the deepest level in the hierarchy.

Appendix F: Usability test

Methods

We recruited six test subjects from a pool of survey respondents who expressed an interest in participating in our test. The subjects were asked to perform three tasks using the kiosk within a hypothetical scenario. They were encouraged to use the entire kiosk, not just the touch-screen.

Task 1: Locate the Media Union building hours.

Task 2: Locate Michele Bejian's phone number and simulate calling her using the kiosk phone.

Task 3: Locate the Technology Assessment Lab.

Task 3B: Walk to it's actual location within the building.

Two team members conducted the tests. One operated the video camera and took notes while the other administered the test. The video was then transcribed and questionnaires were compiled.

Results

Subject		Task 1			Task 2			Task 3			Task 3B	
		screens	time	success	screens	time	success	screens	time	success	time	success
Staff	2	9	2m 13s	N	4	14s	Y	4	27s	Y	2m20s	N
	5	13	92s	Y	5	14s	Y	15	54s	Y	1m	Y
	6	3	34s	Y	7	58s	Y	1	37s	Y	1m	Y
Student	1	10	1m 48s	N	3	11s	Y	10	1m 8s	Y	2m	N
	3	4	18s	Y	3	28s	Y	4	51s	Y	2m	N
	4	3	45s	Y	3	33s	Y	18	2m 32s	Y	2m	Y
Average Total (successful)		7	1m 11s (47.25s)	4/6	4	26s	6/6	9	1m 4s	6/6	1m 43s (1m 20s)	3/6
Bench		3	5s		4	26s		4	17s		1m 10s	

Average percentage of successful clicks: 69%

Used maps for Task 3: 5/6

Conclusions

We identified three major problem areas with the usability of the kiosk. Using Rubin's Criticality measurement (Severity + Frequency), we prioritized the problems to assist us in developing recommendations.

Appendix F: Usability test

Physical Interaction

The first issue is with the physical interaction with the touch-screen. The primary culprit is the un-calibrated touch-screen. The cursor is about half an inch northeast from the users finger, making it difficult for the users to align their finger with the intended target. The secondary culprit is the lack of feedback from a clicked item. This resulted in an average 31% of clicks requiring two, three, or four tries before a successful page load.

Criticality = Severity (3) + Frequency (2) = 5

Information Architecture and Vocabulary

Only four of the six subjects could successfully locate the building hours. Of those successful, the average time of 47 seconds was well below the benchmark of 5 seconds. This task was of comparable difficulty to the second task of finding a phone number, which all six completed successfully with an average time equal to the benchmark of 26 seconds. An explanation lies in the vocabulary of the main menu headings. The phone directory is found under *People*, which users had no problem finding. Building Hours is found under *Things*, which eluded most of the subjects. Even for those who successfully completed Task 1, *Things* was chosen by process of elimination after two or three other tries.

Criticality = Severity (3) + Frequency (3) = 6

Readability and Accuracy of Content

Locating the Technology Assessment Lab proved difficult for half of the subjects. All of the subjects were able to find the Lab under *Places: Labs & Studios*. However, there is no link to the corresponding map location and the only room number given is 1321, the office of the Usability Specialist. Half of the subjects went to room 1321, thinking it was the Technology Assessment Lab. The other three subjects were able to successfully locate and walk to one of the Lab's three entrances. Two of the successful subjects went to the first door they found, which was locked. It should be noted, two of the successful subjects for Task 3b are Media Union staff who possess prior knowledge of the building.

Criticality = Severity (3) + Frequency (4) = 7

Appendix F: Usability test

Usability test script:

Participants:

Technical Support

Host

User

Set up

[***TECHNICAL SUPPORT*** sets up space by kiosk with a camera focused on touch screen to left of main Media Union door.]

[**Technical support also will capture facial expressions on the note-taking sheet.**]

[*HOST MEETS SUBJECT, GIVES INTRO*]

HOST:

It's nice to meet you. Thank you for agreeing to participate.

Introduction

Host: We expect this to take 15-20 minutes. I'm going to be reading from a script to make sure I say the same thing to all participants.

Please review and sign our Institutional Review Board "Informed Consent" form. [Pause] The form offers general information about our study and insures your confidentiality. Signing the form [indicates where to sign] indicates that you have read this information and consent to participate in this study.

[***HOST*** gives IRB consent form and pen to ***USER*** to fill out.]

Host: We'd like to stress that we're testing the usability of the Media Union kiosk and not you personally. [Pause] No information about your specific test will be shared outside of this experiment. [Brightly, after ***SUBJECT 1*** signs] Thanks for your help! [Pause] We have a brief questionnaire. Would you please take your time to fill it out? [***Host*** hands pre-test questionnaire on demographics.]

[***TECHNICAL SUPPORT*** indicates camera's readiness to Host] [***HOST*** indicates to ***USER*** to begin kiosk test]

Host: We are going to run you through a scenario that contains 3 tasks. You are able use the entire kiosk to complete each task. Please indicate when you are finished with a task by saying "I am finished."

Benchmark test

[***HOST:*** verbally instructs saying to ***User:***]

Appendix F: Usability test

“It is exam time and you’ve been studying for hours in the Media Union. Now you’re starving and you want to get some food. You vaguely remember that the Media Union’s hours have changed for the exam period. You want to make sure you have enough time to go and come back. Please find the Media Union building hours using the kiosk.”

[*HOST*: Stands back and watches.]

Critical incidents:

Host: [After *User* appears to complete task]. Good job. Now for the second task you have to arrange a time to meet Michelle Bejian in the Usability Lab. Please use the touch screen to find her number and the phone to give her a call. Please hang up after dialing, before her number rings.

Host: [After *User* appears to complete task]. Now, for a final task, we have a bit of a treasure hunt.

[If *User* can’t complete any tasks, go to next task. Offer

First level hint: You’re on the right track

Second level hint: Try this menu.

Third level hint: Go here.]

Host Please use the kiosk to help you find where the Technology Assessment Lab is located using the touch screen. After you have found this information please walk to the lab. I’ll follow you as you go to look for it.

[***Host*** follows on quest for usability lab.]

Wrap up

Host: You did great. Now let’s go back to the entrance and fill out a second short questionnaire about your experience. [Host escorts subject to bench. Host gives survey and pen to subject.]

Host: [After you get the survey back.] Is there anything else that you would like to tell us about your experience with the kiosk?

[Give the subject their gift certificate]

[***Technical support***: packs up camera, clears area.]

Appendix F: Usability test

Background questionnaire:

Name _____ Age _____

Occupation _____

If you are a student please answer the questions below

Please circle your class standing:				
Freshman	Sophomore	Junior	Senior	Graduate
Please list your major(s) _____				

On average, how many times per week do you go to the Media Union? _____

Had you noticed the kiosks prior to filling out the survey for us? ____Yes ____No

If you have used the information kiosks please answer the questions below

<u>Item used</u>	<u># of times you used it</u>
Touch screen	_____
Phone	_____
Maps	_____

What information kiosks have you used at other locations?

Appendix F: Usability test

Post-test questionnaire:

The following questions ask you to rate how easy it was to perform the various tasks. Please check only one.

Name: _____

Finding the Media Union building hours was easy.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Finding a phone number was easy.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Once I found the number, making a phone call was difficult.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Finding room information using the kiosk was easy.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Actually locating the room within the Media Union was easy.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Overall, the kiosk was easy to use.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

In its current state, I would NOT use the kiosk again.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Please add any other comments you feel will help us evaluate the Media Union kiosk (feel free to use the back of the page):

Appendix G: Visual Display Analysis

Page Design

- The main menu is located at the top of the screen, and accessible from all pages.
- Hyperlinks are not consistently colored.
- Lack of bounding boxes and visual feedback makes links difficult to recognize and click.
- The *map* link is small, and difficult to see.

Maps

- Poor contrast and small fonts decreases readability.
- Not oriented correctly with the physical space.
- No “you are here” indicator.

Physical Design

- The physical container blends in too well with the environment. There is no contrast or signage to draw attention to the kiosk.
- There is no indication that the screen is meant to be touched.
- The phone and maps are not easily accessible from the touch-screen.
- One of the four kiosks has a touch-screen located low enough for wheelchair access. The other three are situated at eye level.

Understandability of Terms—Maps legend

- The legend does not include all letters used on the maps.
- Letters included are E, T, ES, P and W for elevator, restroom, emergency stairs, printer and water fountain.
 - T does not easily correspond to restroom and W, while standing for water, does not easily mean the more commonly used term: drinking fountain.
- Metaphor Analysis
- Kiosk uses “Noun” metaphor with “People, Places, Things” layout.
 - Metaphor seems to work for people and places.
 - Users were able to find what they sought in user tests.
 - Noun metaphor falls apart for “Things”.
 - Users expectations don’t seem to map to what is behind the link, especially hours or FAQ.

Object-Action analysis

- The menu command structure does not apply to the kiosk since there is no toolbar.
- There is one main action accomplished by touching = “Go to.”
 - The fact that there is only one type of action that the user can take highlights the importance of labeling. Users know that they will touch a word and be brought to another screen of information. The users need to be able to associate the term to touch on with the information they are looking for.

Appendix I: GOMS analysis

Goal

The goal of our GOMS analysis was to find the time needed to perform a series of three tasks.

- Find the building hours of the Media Union
- Find Michelle Beijan's phone number from the kiosk
- Find the Technology Assessment Lab from the kiosk

Assumptions: Following is the list of assumptions we made for the tasks:

- The time needed to touch the touch-screen and perform an operation is an unknown parameter. In order to find this time we drew a rectangle on a wall and touched it as if it were the touch-screen. A single touch involved extending our hand to the wall, touching within the rectangle on the wall, and then withdrawing our hand back to its original position. This single operation was performed 120 times and took 186 seconds to complete. 186 was then divided by 120 to yield a motor time of 1.55 seconds or 1550 milliseconds to touch the touch-screen and perform an operation. In order to find this motor time, we assumed the user was an expert and would not have any errors while touching the rectangle on the wall 120 times.
- The user begins the tasks starting from the 'Homepage' or first screen of the kiosk.
- No errors occur during while using the touch-screen.
- The user follows the shortest possible path needed to perform the tasks.
- The user does not read all the text on the pages but instead looks for links to find the desired information

Appendix I: GOMS analysis

Task 1: Find the building hours of the Media Union

Steps of the task: Finding the Media Union building hours can be achieved through the following steps:

Step 1: Touch the 'Things' link

Step 2: Touch the 'Hours' link

Step 3: Read the building hours

Time taken for the task: We will first find out the operator sequence involved in the task and then calculate the total time needed to execute the task.

Operator sequence	Time
Step 1: Initiate touching	70 msec
Step 2: Touch the 'Things' link	1550 msec
Step 3: Eye movement to find 'Hours'	230 msec
Step 4: Perceive 'Hours'	100 msec
Step 5: Initiate touching	70 msec
Step 6: Touch the 'Hours' link	1550 msec
Step 7: Read building hours	$170 \text{ msec/syllable} * 33 = 5610 \text{ msec}$
Total time	9180 msec

Time needed to do the task in real life: To see how our GOMS analysis measures up with an actual user's time to complete this task, we did the task ourselves in the exact same sequence and it took us 5 seconds. So our GOMS analysis gives a figure which is close to that number.

Appendix I: GOMS analysis

Task 2: Find Michelle Beijan's phone number from the kiosk

Steps of the task: Finding Michelle Beijan's phone number from the kiosk can be achieved through the following steps:

- Step 1: Touch the 'People' link
- Step 2: Touch the 'MU staff directory' link
- Step 3: Touch the 'B' link
- Step 4: Read Michelle Beijan's phone number

Time taken for the task: We will first find out the operator sequence involved in the task and then calculate the total time needed to execute the task.

Operator sequence	Time
Step 1: Initiate touching	70 msec
Step 2: Touch the 'People' link	1550 msec
Step 3: Eye movement to find 'MU staff directory'	230 msec
Step 4: Perceive 'MU staff directory'	100 msec
Step 5: Initiate touching	70 msec
Step 6: Touch the 'MU staff directory' link	1550 msec
Step 7: Recall that her last name starts with 'B'	1600 msec
Step 8: Eye movement to find 'B'	230 msec
Step 9: Initiate touching	70 msec
Step 10: Touch the 'B' link	1550 msec
Step 11: Eye movement to find 'Beijan, Michelle'	230 msec
Step 12: Read her phone number	170 msec/syllable * 5 = 850 msec
Total time	7250 msec

Time needed to do the task in real life: We did the task ourselves in the same sequence mentioned above. It took us 9 seconds. Our GOMS analysis figure is again close to the actual time needed.

Appendix I: GOMS analysis

Task 3: Find the Technology Assessment Lab from the kiosk

Steps of the task: Finding the Technology Assessment Lab from the kiosk can be achieved through the following steps:

- Step 1: Touch the 'Places' link
- Step 2: Touch the 'Labs & Studios' link
- Step 3: Touch the 'Technology Assessment Lab' link
- Step 4: Touch the 'Maps' link on that page
- Step 5: Touch the 'First Floor' link
- Step 6: Read 'Technology Assessment' from the map

Time taken for the task: We will first find out the operator sequence involved in the task and then calculate the total time needed to execute the task.

Operator sequence	Time
Step 1: Initiate touching	70 msec
Step 2: Touch the 'Places' link	1550 msec
Step 3: Eye movement to find 'Labs & Studios'	230 msec
Step 4: Perceive 'Labs & Studios'	100 msec
Step 5: Initiate touching	70 msec
Step 6: Touch the 'Labs & Studios' link	1550 msec
Step 7: Eye movement to find 'Technology Assessment Lab'	230 msec
Step 8: Initiate touching	70 msec
Step 9: Touch the 'Technology Assessment Lab' link	1550 msec
Step 10: Eye movement to find location	230 msec
Step 11: Read 'Room 1321'	170 msec/syllable * 5 = 850 msec
Step 12: Perceive 'Room 1321' = Technology Assessment Lab	100 msec
Step 13: Eye movement to find 'Maps'	230 msec
Step 14: Initiate touching	70 msec
Step 15: Touch the 'Maps' link	1550 msec
Step 16: Eye movement to find 'First Floor'	230 msec
Step 17: Initiate touching	70 msec
Step 18: Touch the 'First Floor' link	1550 msec
Step 19: Eye movement to find 'Technology Assessment Lab'	230 msec
Step 20: Read 'Technology Assessment' from the map	170 msec/syllable * 7 = 1190 msec
Total time	11720 msec

Appendix I: GOMS analysis

Time needed to do the task in real life: It took us 17 seconds to do the task following the sequence mentioned above. Our GOMS analysis figure is off by only 5 seconds.

QUESTIONS

Do the information kiosks meet basic, already established heuristics? Is the kiosk's vocabulary and visual display consistent? Does the structure of information match the users' mental model? Does the system have adequate response time? Is there a help system?

METHODS

All group members completed a heuristic evaluation separately. Two people completed the Olson checklist and the other two completed the Nielson checklists. The results from these heuristic evaluations were then collected to form a comprehensive list.

RESULTS

- Labeling: “Things” is an ambiguous label and does not have a strong information scent.
- Maps Link: Goes to the same page where ever it is clicked from—even when it is clicked from a certain lab or studio page, it will not go directly to the map that contains the place. It also does not fit into the hierarchy.
- Main Screen Link: It is not clear that this is a link because it is not underlined.
- Feedback: The system does not let the user know that it registered a touch. It also does not let them know if they clicked outside of the link.
- Slow Response time: The system is very slow to respond to users' touch
- Map Page: Uses a small font and is difficult to read.
- Graphics: Inconsistent usage throughout the system.
- Links: The area is small.
- Page Format: Some of the screens in the labs and studios section do not provide the same information (e.g. some provide hours, others do not).
- Phone: Phone numbers are provided, but the phone is on the opposite side of the kiosk.
- Back: There is no real back button.

Appendix J: Heuristic evaluation

Checklists for heuristic evaluation

Nielson Checklist

Reviewer: Susannah

Category	Priority*	Problem
Simple and natural dialog	2	Layout is difficult on the places page. There is a list with 3 places/line, but they are not lined up in columns. It is difficult for the user to parse into different places.
Speak the users' language	3	“Things” is not a good label. It does not provide strong information scent for the pages it contains—building information.
Minimize user memory load	3	If the user finds a place and then clicks on the map link they are required to hold room number in memory so they can click on the correct floor.
Consistency	2	The top-level link is not underlined like all the other links.
Feedback	3	The system has very slow response time and does not let the user know that it registered a touch.
Clearly marked exits	2	The top-level link could be considered an exit. This is not well marked—it is difficult to tell that it is a link—it just says Media Union.
Good error messages	NA	
Shortcuts	1	The system provides navigational elements at each page that allow the user to get to the first and second levels of the hierarchy and the maps section with one touch.
Prevent errors	NA	
Help and Documentation	NA	The whole kiosk is really a help system.

*(1) no problem, (2) minor problem, (3) major problem, (NA) non-applicable

Appendix J: Heuristic evaluation

Nielson Checklist

Reviewer: Sadat

Category	Priority*	Problem
Simple and natural dialog	3	Map link only takes you to top level from wherever you click. It also is small and not that visible.
	2	The map that is displayed uses a small font and makes finding a location difficult.
Speak the users' language	3	The term "things" is ambiguous. The classification schema or grouping is non-intuitive.
Minimize user memory load	2	The maps section requires that the user hold information in their memory.
Consistency	2	Some labs and places have graphics or pictures, others do not.
	2	The Groundworks page has a different format with more information than all of the other labs. It is also listed twice in the hierarchy.
Feedback	2	It does not tell the user that they clicked on a spot that is not a link.
Clearly marked exits	2	The main page link is not underlined and is just text, so it is not obvious it is a link
Good error messages	2	No feedback when user clicks outside of link.
Shortcuts	NA	
Prevent errors	2	Better system calibration is necessary. Make the link area bigger.
Help and Documentation	2	FAQ is not easily accessible.

*(1) no problem, (2) minor problem, (3) major problem, (NA) non-applicable

Appendix J: Heuristic evaluation

Olson Checklist

Reviewer: Tom

Category	Priority*	Problem
Consistency	2	<i>Maps</i> does not really fit into the P,P,T hierarchy, although it is treated as a <i>Thing</i> . Groundworks is accessible from both <i>Places</i> as well as the second-level heading <i>Labs and Studios</i> .
	2	There is no back button, which is common to most web applications. The Media Union graphic serves as a home button, but this is not immediately apparent.
Correspondence	3	<i>People</i> and <i>Places</i> makes sense, but the labeling breaks down with “Things”. Building Hours, Events, and FAQs are informational objects, not physical things.
	3	Task order: <i>Places</i> displays room numbers, but user must remember number and go to separate screen to find room on map. <i>People</i> displays phone number, but phone is located on opposite side of kiosk.
Error Recovery	NA	There are no error messages.
Help and Docs	NA	There is no help or documentation.
Menu/Command Structure	1	The hierarchy is shallow and broad, an appropriate design for this type of device.
System Response Time	3	The responsiveness of the touch screen is quite poor. Many menu items, especially the smaller ones such as <i>maps</i> require multiple touches. This is due to the poor calibration of the screens and lack of visual bounding boxes for the icons.
	3	There is also no visual feedback that an icon has been touched.
Training	NA	No training is necessary.
Visual Display	3	Similarity: All links are underlined, keeping with Web standards. Menu headings are black and second and third level links are orange. This breaks down slightly with the <i>map</i> link, which is halfway between first and second level by nature of its color and location.
	3	The lack of bounding boxes and around menu links exacerbates the cursor calibration problem. This forces users to make multiple clicks on menu items.
	3	The maps are not very readable on the screen. The printed versions are more readable, but they are not oriented correctly and lack a “you are here” indicator.

*(1) no problem, (2) minor problem, (3) major problem, (NA) non-applicable

Appendix J: Heuristic evaluation

Olson Checklist

Reviewer: Theresa

Category	Priority*	Problem
Consistency	3	The maps link is smaller and in a different font.
	3	Information is not consistently ordered.
	3	Navigation back to the home screen is difficult.
	2	The maps link is not available from the top level.
Correspondence	3	Users are not able to translate their queries into the overbroad, unclear categories of Persons, Places and Things. There also is no information scent from the home page to where the FAQs are actually listed at the bottom of the page in Things. Information scent is, moreover, lacking throughout.
	2	It would seem that one major query would be wayfinding. There is no link to the maps from the top level.
Error Recovery	NA	
Help and Documentation	3	No help is available in the system.
Menu/Command Structure	NA	
System Response Time	3	The system is very slow causing users to double touch. No feedback that system has registered the touch.
Training	NA	
Visual Display	3	The maps are very difficult to read. The letters are non intuitive (e.g. T for Restroom).
	2	Title bar uses similar shades of blue for two different categories making differentiation difficult.

*(1) no problem, (2) minor problem, (3) major problem, (NA) non-applicable

Appendix K: Cognitive Walkthrough

QUESTIONS

What do users' have to know in order to use this system? Are there any mismatches between the users' conceptualization of the task and how the kiosk allows them to perform the task? What are difficult tasks to accomplish and what steps are difficult or not intuitive? Does the order of the screens make sense? Will the user be able to make associations between the correct actions and their desired result?

METHODS

We performed a cognitive walkthrough of two tasks using the Media Union Information Kiosks. One of the tasks was finding the building hours. The other task was to locate a room. At each step in these tasks, we asked 4 questions:

1. Will the user try to achieve the correct effect?
2. Will the user notice that the correct action is available?
3. Will the user associate the correct action with the effect to be achieved?
4. If the correct action is performed, will the user see that progress is being made toward solution of the task?

RESULTS

For the most part, the user is not likely having problems trying to achieve the correct effect. There is only 1 type of task that is available at the information kiosks—finding information. There is also only one way to find information—to navigate through the screens by touching the screen. The user will almost always be trying to navigate through the screens, so the user will be trying to achieve the correct effect.

The user will also almost always realize that this action is available. However, in other situations or performing other tasks, this might action might not be as obvious. For instance, if the user wanted to get back up to the top level, they need to click on the picture of the Media Union—it is a link. However, it does not look like the other links, so the user might not notice this action is available.

The major problems that user will have is in associating the link they need to click on, with the information that is contained in that link. For instance, the association between “things” and “building hours” is unlikely. If the user is looking for the “Usability Lab”, they need to look under the “Technology Assessment Lab”. This association is not too difficult, however, it does require some thought.

Another major problem that occurs when looking for a location is when the user clicks on the “maps” link. If they click on this link from a place, they are likely to think that they will reach a map that contains that place. However, they are brought to a page that makes the user choose which floor they want to view. The user is not likely to think of this as progress. They also might have forgotten which floor the place was even on.

Appendix K: Cognitive Walkthrough

DISCUSSION

The Cognitive Walkthrough highlights the importance of the vocabulary. It is extremely important that the user is able to make the association between the word and the information contained in that link. Navigation around the screens is cumbersome and takes a fair amount of time, so success in this association is crucial. The cognitive walkthrough also shows that some screen sequences are not anticipated by the user and are not seen as progress.

Appendix K: Cognitive Walkthrough

Cognitive walkthrough analysis

TASK #1: Finding the building hours

Main page → click on “Things”

1. Will the users try to achieve the right affect? From the main page the user will realize that they need to click on one of the three links to get the information.
2. Will the user notice that the correct action is available? The user will probably realize that they are able to click on one of the three words because it is underline.
3. Will the user associate the correct action with the effect to be achieved? It is unlikely that the user will associate the word “things” with the building hours.
4. If the correct action is performed, will the user see that progress is being made toward solution of the task? If the user gets to the next screen there is adequate feedback so the user knows they have clicked on the correct link.

Things → click on “Hours”

1. Will the users try to achieve the right affect? Once again, the users will realize they need to click on a link. This is really the only action available at the kiosk.
2. Will the user notice that the correct action is available? The user will probably notice the link that they need to click on.
3. Will the user associate the correct action with the effect to be achieved? The word “hours” contains enough information so that the user will click on it.
4. If the correct action is performed, will the user see that progress is being made toward solution of the task? The goal is reached.

TASK #2: Finding the technology assessment laboratory

Main page → click on “Places”

1. Will the users try to achieve the right affect? The user will want to click on a link because that is the only action available.
2. Will the user notice that the correct action is available? Once again, touching is the only action available.
3. Will the user associate the correct action with the effect to be achieved? The word “Places” contains enough information scent that the user will choose this item.
4. If the correct action is performed, will the user see that progress is being made toward solution of the task? The output is a list of places, which will give the user positive feedback about their choice.

Places → click on “Labs & Studios”

1. Will the users try to achieve the right affect? The user will want to click on a link because that is the only action available.
2. Will the user notice that the correct action is available? Touching is the only action available.
3. Will the user associate the correct action with the effect to be achieved? The term “labs and studios” also contains adequate scent.

Appendix K: Cognitive Walkthrough

4. If the correct action is performed, will the user see that progress is being made toward solution of the task? The user will get a list of the labs and studios, which is also good reinforcement about their choice.

Labs & Studios → click on “Technology Assessment Lab”

1. Will the users try to achieve the right affect? The user will want to click on a link because that is the only action available.
2. Will the user notice that the correct action is available? Touching is only available action.
3. Will the user associate the correct action with the effect to be achieved? If the user knows that the Tech. Assessment Lab is the usability lab than they will click on the right link. However, if they only have the term usability lab in their head, they might not click on the proper link.
4. If the correct action is performed, will the user see that progress is being made toward solution of the task? They will get information about the room number at this page.

Tech. Asses. Lab (hold room in memory) → click on Maps

1. Will the users try to achieve the right affect? The user will want to click on a link because that is the only action available.
2. Will the user notice that the correct action is available? Touching is the only action available.
3. Will the user associate the correct action with the effect to be achieved? Most likely the user will associate the word Maps with some sort of way-finding aid, so they will make the correct association.
4. If the correct action is performed, will the user see that progress is being made toward solution of the task? The user will probably be confused because they get a listing of the floors, not a picture or map. They might think that they clicked on the wrong link. This is sort of a step back, because the user found the room number, but when they tried to find the room by clicking on maps, they are at a more general level.

Maps (still hold room in memory) → click on First Floor

1. Will the users try to achieve the right affect? The user will want to click on a link because that is the only action available.
2. Will the user notice that the correct action is available? Touching is the only action available.
3. Will the user associate the correct action with the effect to be achieved? They will associate the correct action if they have remembered the room number and can infer the floor from the room number.
4. If the correct action is performed, will the user see that progress is being made toward solution of the task? If they are able to read each room name on the map, they will see they chose the correct floor.

First Floor: The user will have to find the room.

1. Will the users try to achieve the right affect? The user will want to click on a link because that is the only action available.

Appendix K: Cognitive Walkthrough

2. Will the user notice that the correct action is available? No action is necessary but scanning.
3. Will the user associate the correct action with the effect to be achieved? The user can see from this page that all the rooms on the first floor are listed, so they can tell that they will need to read each one.
4. If the correct action is performed, will the user see that progress is being made toward solution of the task? The user will be able to tell where the room is from a bird's eye perspective, but they might not be able to get closer to the goal of figuring out how to find the room.

Appendix L: IRB Consent Form and Approval

School of Information

I agree to participate in a study about the Media Union information kiosks. The study should take no longer than 1 hour. I am allowed to ask questions at any time throughout the study. Information is being gathered so we can evaluate the kiosks. This is part of a class project for the School of Information at UM. The information I provide will be analyzed to evaluate the service, not to evaluate me.

The findings will be reported in the aggregate, not attributing particular comments to particular people. My privacy will be protected.

I will be video-taped for this study. The tapes will be destroyed after analysis.

I understand that my participation is strictly voluntary. I may decline to answer anything I wish. I do not have to participate if I am uncomfortable.

In return for my time, I will receive one free movie rental pass.

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Appendix M: Summary of interview with MU staff

QUESTIONS

It is important that our group understand the reasons behind the creation of the Media Union kiosks. What problems were they designed to solve? Who was the intended audience? What were the needs of this audience and how did the designers hope to meet those needs?

METHODS

On Thursday, February 14, 2002 the four members of our evaluation teams met with employees of the Media Union. Glenda Radine, Assistant Director of Public Affairs, Julieclare Parrish, Coordinator of Visual Communications, and Steve Baker, TITLE, were present at this meeting.

RESULTS

Radine discussed with us the mission of the Media Union. It is a center that hopes to bring together art, science, and technology to support interdisciplinary work. Although they mostly serve the schools located on North Campus, they desire to serve the entire University community.

All three employees of the Media Union talked about how confusing navigation around the building is. They said that the goal of the kiosks is to tell people what is in the Media Union, help them find their way around the Media Union, and help people find staff members who work in the building. The kiosks were designed so that people can find the information themselves.

Parrish informed us that the kiosks have always been a part of the building. In YEAR????, it was determined that the computers running the kiosks were very old and they were taken down. In 2001, Parrish decided it was important to have the kiosks in operation, so she put a pared down version of the Media Union website on the machines. The Media Union is planning to redo the information kiosks in the next couple of months. Parrish felt it was important to have something that is functional on the kiosks until the new design can be implemented.

Radine, Parrish, and Baker expressed a desire to learn what information people would like to see in the information kiosks.