

$$\frac{113}{115} = 98$$

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CIS 443/543 User Interfaces – Midterm

A.Hornof – 10/30/19

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Do not put your name on this exam. Put your student ID number here:

Please read these instructions. There are a total of 22 questions and 140 possible points for this exam.

The numbers in parentheses indicate the number of points assigned to a question.

You may not refer to any media or materials other than your brain and the exam. Any evidence of academic dishonesty will be taken seriously. You may not give or receive aid on this exam. If it is determined that you cheated then you will fail the class.

The instructor cannot answer any questions that you may have during the exam. If something is unclear, please just do the best that you can.

Define terms. Define all abbreviations and acronyms at their first occurrence. When defining terms, use words that are not in the term that you are defining.

5. (5) In this class, what is HTA?

Hierarchical Task Analysis (HTA) is an approach that modularizes a complex activity in subtasks that can be organized in a hierarchy, a tree-like structure. It helps to present a task into increasingly easier-to-understand operations.

10. (10) What is the role of the “plan” in the HTA? What are the three common types of plans discussed in the reading?

Plan dictates the relation between a task and its subtasks. It helps the user which subtasks to follow and in which order it should go.

3 types of plans: 1) Fixed sequence, 2) Selective Rules
3) Dual task

1. (5) What is one important aspect of work that is not so well captured by HTA?

1) Stop criteria is not so accurate/fixed.

2) does not require lots of time, skills, people.

social aspects, Emotional aspects.

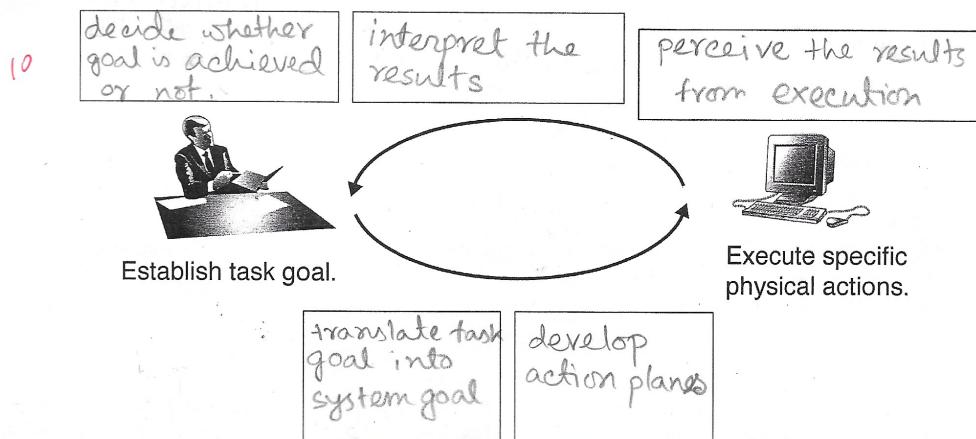
5. (5) HTA corresponds most closely with what kind of human memory? (5 words or fewer)

Long-term-memory and production memory. procedural

5. (5) The textbook for the class includes a section at the end of every chapter discussing a particular system that is built using scenario-based design. What is that system?

a virtual science fair - moosburg system

6. (10) Fill in the boxes to list the seven stages of action of a person interacting with a computer.



1. To keep in mind that the interface needs to support human goals, to help a user to understand at every point in interaction how he or she can move closer to those goals, and whether each input to the system moves the user closer to the goal.

2. To keep in mind that the outputs need to be perceived by the user and that they need to be interpreted by the user. 7. (5) Why is it useful to keep these seven stages of action in mind when designing a user interface? In other words, how will knowing these stages help you to design a useful and useable interface?

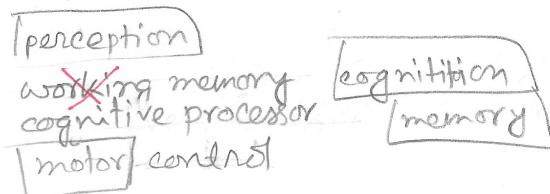
These seven stages helps a designer to [identify the goal of a task] and then helps to [identify the actions needed to achieve the goal] and finally to check whether they are making progress towards the goal or not after the execution of the action. In a word it helps designer to organize a task in model phases.

3. To keep in mind that the system needs to help understand what actions need to take or he/she can move closer to the goal.

8. (5) What are the two classic measures of human performance? (Hint: There is a "tradeoff" between the two.)

speed and accuracy

4. 9. (5) What are the four major stages of human information processing? (Please just write four words.)



People can move their eyes to sample & resample areas of a visual scene, so it is relatively easy to refresh visual-perceptual memory. An auditory event, however, often occurs just one time, in which case the only way to re-sample the event is by using the info that persists in auditory-perceptual memory. Page 3

10. (5) Why would auditory-perceptual memory evolve to decay more slowly than visual-perceptual memory? In other words, why is it useful that auditory-perceptual memory lasts a little longer than visual-perceptual memory?

Because through auditory-perceptual memory, a person can remember only 5 letters and it lasts 1500 ms. while the visual-perceptual memory can recall 17 letters and it lasts only 200 ms.

→ the auditory image storage is storing less input and

ST	L T	11. (10) What are three major differences between short-term and long-term memory? So it lasts longer in working memory.
Quick in Quick out	slow in & slow out	1. short term: doesn't take time to put any input in.
Decays rapidly	Decays slowly, can last lifetime	long " ; it takes time to no rehearse to store.
small capacity	infinite capacity	2. short term: doesn't even take time to retrieve. like muscle memory. long term: takes longer time to recall something. 3. Through encoding, a short term memory can become a long-term memory. (But there is no way to do the opposite) no

12. (10) Write the equation for Fitts' law. Define all of the terms that are measures of something.

$$T = a + b \log_2 (D/S + 1)$$

a, b are constants

D is the Distance between the target and mouse pointer

S is the target size

T is the movement time required (pointing time to minimize practiced aimed movement).

- 4 13. (5) Identify a feature of a user interface that could be praised in terms of how Fitts' law would predict good user performance with that feature. First describe the feature and then explain how Fitts' law would predict good user performance.

Very large buttons on a touch screen in a car would create a very large S, which shortens

Targets that are on the edge of a display, such that you can slam your cursor up against the edges of the display, create a very large S.

that makes for to understand

4 14. (5) What is an affordance?

Affordance is a perceivable characteristics of an objects that tells the user what the object can be used for and how the access to it can be manipulated.

5 15. (5) What is the best way to figure out if something is truly an affordance? (Use ten words or fewer.)

through empirical data after using the technology by human subjects.

5 16. (5) In a user interface, what is a mode? Provide a specific example.

Mode is a restricted interaction state, in which certain actions are possible.

Example: A "modal" dialog box does not let users to perform any other activity on the computer, until the user responds to it.

5 17. (5) In general, when designing a user interface, should you try to include or to avoid modes? Why?
 they work against flexible task switching & activity management

User Interface designers should definitely avoid modes. Because, although in smart phones it is used abundantly to allow reconfigurable flexibility, the modes require lots and lots of mouse click or button presses or swipes to move from one mode to another.

5 18. (5) What is ethnography and how can it contribute to good user interface design?

Ethnography is a study where an analyst gets intensely involved with a group as either a participant or an observer. Here, the analyst tries to understand the group deeply in and out.

In user interface design, through ethnography, a requirement analyst can understand the users' perspectives and users' expectations and then use the gained knowledge in the design decision for the interface.

19. (5) The New York Times recently published an article entitled "16 Useful Gems in Apple's New iOS 13". A "gem" is a precious stone, a good thing. Here is one of the gems:

Also, finger-moving behavior is not a standard established interaction technique as is pulling two fingers apart to zoom in on a touchscreen. And so the user does not benefit from consistency with other interfaces or put it another way, the user cannot reuse procedural knowledge developed on another device.

"It's even faster to use the new three-finger gestures. For Copy, pinch on the screen with three fingers. For Cut, do that twice. For Paste, tap where you want to paste, and then unpinch with three fingers (spread them)."

Based on concepts taught in this class, is this truly a gem? Explain your answer using concepts taught in this class.

I don't think this gesture is a gem. Because, it lacks affordance. It is obviously not perceptible to user how to pinch and pinch out for copy and paste. And also, user will require long rehearsal to remember the gestures necessary for a task. For smaller devices, it's impossible to put three-fingers gesture in action.

20 (5) What is design?

A design is a model phase through which a designer gets the storytelling of a task and subtasks, identifies what is the main goal of the design and also brings a balance between the physical action requires and achieving the goal.

21. (10) Write the Python 3 code needed to display "a" if the user presses the "a" key, and quits if the user presses the "q" key. Use the "readchar" library.

The process (& outcome from the process)
of proposing & evaluating alternative solutions to
solve a problem

```
import readchar
while (true):
    key = readchar.read()
    if (key == 'a'):
        print(key)
    elif (key == 'q'):
        break
```

readchar.readchar()

22. (10) The University of Oregon's information technology (IT) department recently changed the way that end-users contact IT with questions. Instead of emailing a question to a posted email address, as was done for decades, users must now submit questions using an online "portal". The steps involved in this process are as follows:

1. Log on to the website "<https://service.uoregon.edu>".
 2. Click on "Request Help Online".
 3. Study the list of categories that appear (there are initially fourteen categories) until you find the category that most closely relates to the question to be asked, and then click on that category.
 4. Scroll to the bottom of the next web page that appears to see if a large green "Request Help" button has appeared at the bottom of that page. If it has not appeared, go to Step 3. If it has, go to Step 5.
 5. Click on the large green "Request Help" button.
 6. Enter a UO <username> and <password>, and click on "Login".
 7. A web page with text boxes appears. Type a "Title for a ticket" in the first text box.
 8. Study the remaining text boxes, check boxes, and radio buttons that appear on the web page. The screen objects that appear will vary depending on the categories that were selected in Step 3.
 9. Visually scan the text associated with each of these screen objects looking for a red asterisk, which indicates a "required" field.
 10. Enter data into the required fields, even if just garbage data to get the request submitted.
 11. Scroll down to a text field entitled "Description" and type the original question into that field.
 12. Scroll down to a button labeled "Request" and click on that button.
 13. If the question is not accepted because a "required" field was skipped, go to Step 9.
 14. If the system displays "Request Created Successfully!", the task is complete.
- what if I don't find my exact category.*
- so many clicks take lots of physical movement so, more time while*

Take the perspective of the end-user, and critique the old way versus the new way for sending questions to IT. Which way is better? Why? Do not just give your opinion. Critique the two approaches, and the differences between them, using at least three specific concepts taught in this class.

Emailing versus online "portal".

1. In step 3, it's not always possible to find exact category and it's time consuming to match each category with the user's question in his or her mind.
2. This new system requires lots of physical movement - mouse clicks - that requires a lot more time to process from hands and eyes, compared to just typing emails.
3. In step 11, the user types the description of the problem why he or she needs help from IT department. *this portal also comes with a lot more scrolling and mouse clicking. While in emailing user had to do only typing with one or two mouse click*