IS4300 – Final Exam

Name _____

Table 1. Classes of usability problems

A. visibility problem
B. feedback problem
C. conceptual model problem
D. affordance problem
E. internal consistency problem
F. external consistency problem
G. simplicity problem
H. problem preventing errors / not allowing error recovery
I. problem not speaking the user's language

Table 2. Usability metrics

M. learnability
N. efficiency
O. memorability
P. error rate
Q. satisfaction

Table 3. Measure Types

R. ordinal
S. nominal
T. ratio
U. interval

I. Concepts & Definitions (20%)

1. Usability problems. For each of the following write which usability problem from Table 1 best describes the problem.

1a. ___ A user clicked on the "UPDATE" button at the top of a dialog, but instead of displaying an "UPDATED" message and an audio alert, as every other dialog in the application does, this one pops up a confirmation sub-dialogue.

1b. ___ A user is trying to open a file in an interface, but has no idea what to click on.

1b. ___ A user just selected "File…/Save" from their application's menu, but has no idea whether anything was actually saved or not.

1c. ___ A user clicks the little 'x' on the upper right corner of their new Windows-based joke-of-the-day application but, instead of closing the application (as the user expects), it displays another joke.

1d. ___ A user clicks on one of the arrows in the UI panel shown but nothing happens (the user is supposed to drag the arrow in the indicated direction to scroll the display).

I. Concepts & Definitions, continued

2a. Indicate which of the following orderings is correct for the 7 steps of Norman's interaction model (O1-O6): _____

1. **formulate intention**
2. **interpret system state**
3. **evaluate system state with respect to goal**
4. **specify actions at interface**
5. **perceive system state**
6. **establish the goal**
7. **execute action**

Orderings (pick one):

O1. 1 2 3 4 5 6 7
O2. 6 1 4 7 3 5 2
O3. 4 7 5 2 3 6 1
O4. 6 1 4 7 5 2 3
O5. 1 6 5 4 7 2 3
O6. 7 3 2 1 6 4 5

2b. _____ Which steps above concern the "gulf of execution"?

2c. ___ What kind of usability problem (one item from Table 1) is the "gulf of execution" most related to?

2d. _____ Which steps above concern the "gulf of evaluation"?

2e. ___ What kind of usability problem (one item from Table 1) is the "gulf of evaluation" most related to?

2f. _____ In which steps can "slips" occur (Norman's terminology)?

2g. _____ In which steps can "mistakes" occur (Norman's terminology)?

I. Concepts & Definitions, continued

3. You are to design a new interactive grocery store kiosk to dispense gumballs for kids, to replace the racks of mechanical gumball machines found at the front of most stores.

3a. Who are the primary stakeholders (check all that apply)?

☐ Kiosk servicer (restocks gumballs, collects money).
☐ Grocery store owner. ☐ Grocery store staff.
☐ Kids. ☐ Parents. ☐ You.
☐ Manufacturer of mechanical gumball dispensers.

3b. Who are the secondary stakeholders (check all that apply)?

☐ Kiosk servicer (restocks gumballs, collects money).
☐ Grocery store owner. ☐ Grocery store staff.
☐ Kids. ☐ Parents. ☐ You.
☐ Manufacturer of mechanical gumball dispensers.

3c. Who are the tertiary stakeholders (check all that apply)?

☐ Kiosk servicer (restocks gumballs, collects money).
☐ Grocery store owner. ☐ Grocery store staff.
☐ Kids. ☐ Parents. ☐ You.
☐ Manufacturer of mechanical gumball dispensers.

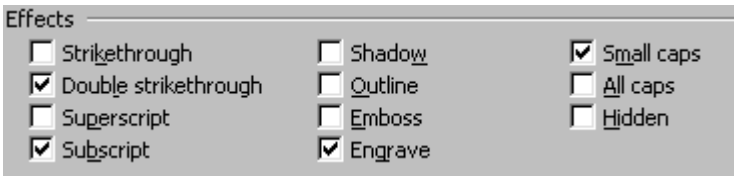
3c. Who are the facilitating stakeholders (check all that apply)?

☐ Kiosk servicer (restocks gumballs, collects money).
☐ Grocery store owner. ☐ Grocery store staff.
☐ Kids. ☐ Parents. ☐ You.
☐ Manufacturer of mechanical gumball dispensers.

II. UI Critique (15%)

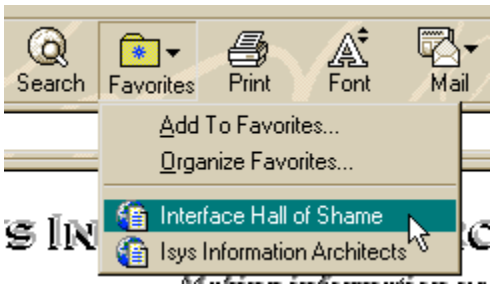
For each of the following, list the single most significant usability problem in Table 1 that applies:

4. An early version of Word featured the following dialogue box to set text attributes.



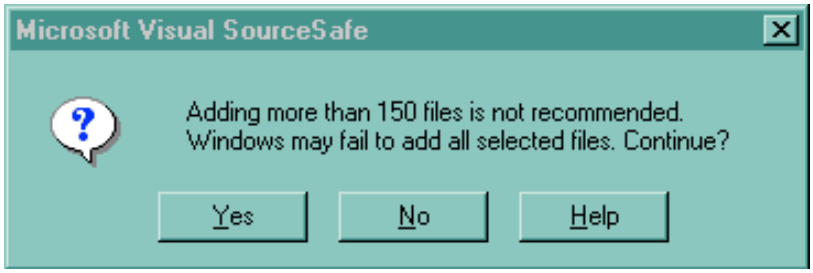
4. _____

5. An early version of IE featured a toolbar that displayed a pop-up menu when clicked.



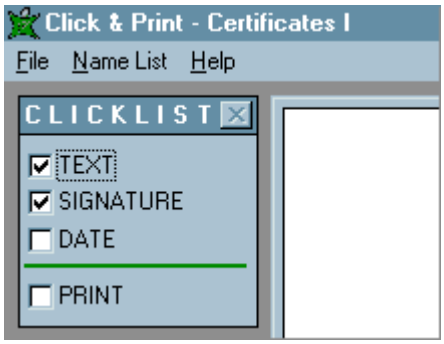
5. _____

II. UI Critique, continued

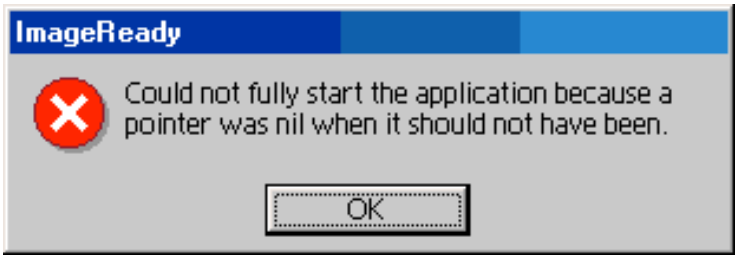


6. _____

7. The following control panel is from a program to print certificates. When a checkbox is clicked a modal dialogue box appears. After the dialogue box is filled out and 'OK' clicked, the checkbox is checked to show that you have completed the operation.



7._____



8._____

III. **Design Problems (25%)**

You are design HopTilDrop, a system that takes user preferences, budget, alcohol stamina, weather conditions, and preferred start and end times, and plans an optimal series of bars to visit in a specified neighborhood. You are asked to design user interfaces for a Windows application, web site, and Google Glass.

9a. Sketch the main page of the Windows Application. You can use call-outs to annotate what the most important controls do. Be sure to describe some rationale and method for control grouping and use of metaphor.

9b. Sketch the home page of the web site. You can use call-outs to annotate what the most important controls and hyperlinks do. Describe and justify two differences from the Windows app:

1._____

2._____

9c. Sketch a storyboard for the main function of the Google Glass app. You can use call-outs to annotate what the most important controls do. Describe and justify two differences from the Windows app:

1. _____

2. _____

Part IV. Evaluation and Usability Testing (40%)

10. You want to conduct a usability evaluation on two commercial accounting packages so you can pick which one your manager should order for the entire company.

10a. is this a formative or summative evaluation (check one)?

☐ Formative. ☐ Summative.

10b. which kind of evaluation method is most appropriate (check one)?

☐ Think aloud.
☐ Heuristic evaluation.
☐ Descriptive study.
☐ Observation.
☐ Cognitive walkthrough.
☐ Quantitative experiment.
☐ Interview.
☐ Ethnography.

10c. _____ which usability metric (Table 2) is most important to measure?

10d. describe exactly how you would measure the metric in 10c (you do not need to describe the entire study protocol).

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Part IV. Evaluation and Usability Testing, continued

11. You want to conduct a usability evaluation on a low fidelity prototype to provide feedback to the design team. You do not have access to any test users (only designers), and your manager does not want you to use any checklists of design principles.

11a. is this a formative or summative evaluation (check one)?

☐ Formative. ☐ Summative.

11b. which kind of evaluation method is most appropriate (check one)?

☐ Think aloud.
☐ Heuristic evaluation.
☐ Descriptive study.
☐ Observation.
☐ Cognitive walkthrough.
☐ Quantitative experiment.
☐ Interview.
☐ Ethnography.

11c. _____ which usability metric (Table 2) is most important to measure?

11d. describe exactly how you would measure the metric in 11c (you do not need to describe the entire study protocol).

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12. The MBTA hires you to conduct formative usability testing for a new web page they are developing that lets riders report overly-polite people to the Transit Police (part of the "see something, say something" program). The interface lets you upload a digital photo and description of the offending kind act, and specify the station and time the event occurred at.

After test users have tried the interface, the customer would like them to be interviewed about their experience (using a semi-structured interview) and administered a quantitative satisfaction measure ("Gotta have some numbers for the boss!"). Write the questionnaire and interview guide (protocol) so that a member of the Transit Police could conduct the evaluation without any training.

Questionnaire

(this is the piece of paper that will be handed to test users)

12. continued

Interview Protocol

(these are the instructions for the Transit Police to follow <u>after</u> a test user has finished testing the system)

Usability Test Report

You have just completed usability testing on a web-based social support site for survivors of natural disasters ("BetterThanFEMA.com"). The site features discussion groups organized by disaster to let survivors share their stories and tips with each other, in addition to pages of support services and resources and a live chat capability with a professional counselor.

Test Tasks:

T1. Search for drywall repair professionals in New Orleans.
T2. Add a story to the Hurricane Katrina discussion list.

Satisfaction assessed using a single-item, 7-point scale question.

Raw data from the five test subjects is included in the following pages. Start your analysis by thinking about descriptive statistics. For each measure, indicate (via checks) the descriptive statistics you would use. Assume interval and ratio measures are normal unless noted.

		Range	InterQuartile	SD	Mode	Median	Mean
13a.	Age (outliers)						
13b.	Sex						
13c.	Education						
13d.	T1 Errors						
13e.	T1 Time						
13f.	T2 Errors						
13g.	T2 Time (skewed)						
13f.	Satisfaction						

Data:

Name: Sally Smurf	Age: 19
Sex: female	Education: high school
Disaster experience: Lived in Biloxi, MS during Katrina. House flooded. Computer experience: none.	
T1 completed: Yes	T1 time: 1.2 minutes
T1 errors: 1	
T1 notes: subject could not find resources page link on main page.	
T2 completed: Yes	T2 time: 2.3 minutes
T2 errors: 1	
T2 notes: subject could not recognize the "+" button to add a comment.	
End Satisfaction: 6	End Interview: "important", "cool"

Name: Bob Bumble	Age: 32
Sex: male	Education: some high school
Natural disaster experience: None. Computer experience: Minimal.	
T1 completed: Yes	T1 time: 1.4 minutes
T1 errors: 1	
T1 notes: subject could not find resources page link on main page.	
T2 completed: Yes	T2 time: 3.1 minutes
T2 errors: 3	
T2 notes: subject could not find the Katrina discussion link.	
End Satisfaction: 7	End Interview: "important", "great design"

Name: Arnold Arbuckle	Age: 28
Sex: male	Education: PhD
Natural disaster experience: None. Computer experience: expert.	
T1 completed: Yes	T1 time: 4 seconds
T1 errors: 0	
T1 notes: subject whistled during the task.	
T2 completed: Yes	T2 time: 1.4 minutes
T2 errors: 0	
T2 notes: subject said he thought the site was poorly designed.	
End Satisfaction: 2	End Interview: "stupid idea"

Name: Gertrude Gamer	Age: 25
Sex: female	Education: BA
Natural disaster experience: Loma Prieta earthquake, San Francisco. Computer experience: fluent	
T1 completed: Yes	T1 time: 52 seconds
T1 errors: 0	
T1 notes: No problems.	
T2 completed: Yes	T2 time: 2.1 minutes
T2 errors: 2	
T2 notes: subject said it was not clear that she could add comments to the discussion.	
End Satisfaction: 4	End Interview: "important", "poorly designed"

Name: Tammy Twiddler	Age: 61
Sex: female	Education: high school
Natural disaster experience: Home flooded during hurricane Sandy. Computer experience: None.	
T1 completed: Yes	T1 time: 3.2 minutes
T1 errors: 3	
T1 notes: Subject could not find resources page link on main page.	
T2 completed: No	T2 time: N/A
T2 errors: 7	
T2 notes: Subject could not figure out how to add a comment to discussion.	
End Satisfaction: 2	End Interview: "dumb idea", "I don't know what 'drywall' is."

14. Write the usability test report on the following pages. You do not need to compute descriptive statistics, but indicate where they would appear in your report.