Tutorial Letter 202/1/2017

Human-Computer Interaction 1

INF1520

Semester 1

School of Computing

IMPORTANT INFORMATION:

This tutorial letter contains the answers for assignment 2 semester 1.

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1 INTRODUCTION

Dear student

This tutorial letter contains information about the answers to assignment 2 semester 2.

By now you should have received the following tutorial letters:

TUTORIAL LETTERS	PRESCRIBED MATERIAL
INF1520/101/3/2017 INF1520/102/1/2017 INF1520/201/1/2017	INF1520 Study Guide – MO01 Units 1 to 5

Tutorial letters can also be downloaded from myUnisa or www.osprey.unisa.ac.za, which is the official web site of the School of Computing. https://my.unisa.ac.za also offers services to students but the lecturers do not have direct control over the information provided there.

INF1520 Team

2 ANSWERS TO ASSIGNMENT 2 INF1520

Semester 1 Assignment 2

Due Date:	10 April 2017
Unique assignment number:	702529
Study material:	Study Guide Units 3 – 5
Contribution of mark:	80% of semester mark, i.e. 16% of final mark

Assignment 2 **[50]**

Question 1 **[3]**

Define 'interaction' as used in human computer interaction. Distinguish between the two main types of interaction.

Interaction is defined as any communication between the user and the computer. ✓

Direct interaction involves a dialogue with feedback and control during performance of the task. ✓

Indirect interaction may involve background or batch processing. ✓

Question 2 **[3]**

There are, potentially, many mistakes that designers can make when designing interfaces. Identify at least three problematic design problems.

P45 the forces that work against evolutionary design, ✓

putting aesthetics first (that is, form over function) ✓ and designers regarding themselves as typical users. ✓

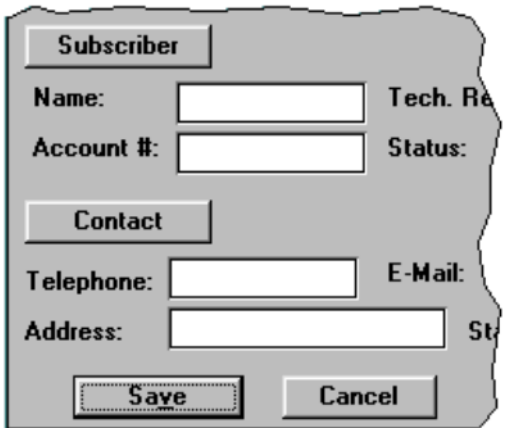
Question 3 **[4]**

Discuss four disadvantages of cluttering interfaces.

P48

1. It can be difficult for users to take in and understand the many different objects that are presented on the screen. Some may be missed entirely. ✓
2. The more objects you present on the screen at once, the more meanings users will have to unravel. ✓
3. The more objects you present, the harder it is for users to find the ones that they really need. ✓
4. The more objects there are on the screen, the smaller the average size of each object will be. This makes it harder to select and manipulate individual screen components✓

Question 4 **[4]**



4.1 Does the subscriber and contact buttons fulfill the purpose of the headings, if nothing happens when the user clicks on them? Yes or No **(1)**

P 48 Yes ✓

4.2 Explain your answer. **(1)**

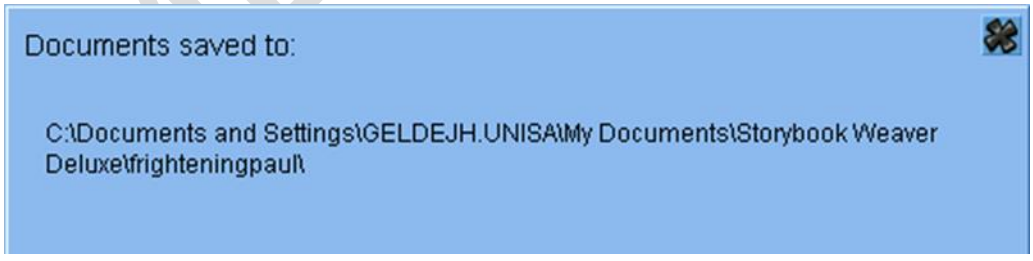
The Subscriber and Contact buttons in this interface **fulfil** the purpose of headings. Clicking on them will have no effect. Still, the user will think they should click on these 'buttons' since they invite clicking. ✓

4.3 What design solution do you recommend should be used to overcome the problem? **(2)**

Use affordance to guide the user into taking the correct action, ✓but we should also be careful to use controls for some purpose if they clearly afford another. ✓

Question 5 **[6]**

When a user clicks on the "Save As Web Document" option on the File menu in Storybook Waever Deluxe 2004, the following message appear:



5.1 Is this a suitable feedback message to a child? Yes or No **(1)**

P51 Novices want more informative feedback to confirm their actions; frequent users want less distracting feedback. ✓

5.2 In what ways/forms can a system provide feedback to the user, using _**sound**__✓__ and __ **absence of sound** __✓___. P48 5.2 tooltips, pop-ups, sound (2)

5.3 Give some examples where sound can be used as feedback mechanism. (3)

We know the **washing machine's door is closed** properly when we hear the click sound. ✓

Sound feedback is extensively used **in cars** – my car beeps annoyingly at a steadily increasing volume when I drive without fastening my seatbelt, it beeps when the petrol tank is close to empty, or a light flickers on dash board indicating that you need to change gears✓.

P50 Sound can also used to make **interface elements more 'visible**'. ✓

Often an error message has a sound attached to it to draw the user's attention to the problem. In products for children who cannot yet read, audio cues can be attached to icons instead of text labels. Sound calls our attention to an interface when there is new information, e.g. a beep on a cell phone signaling the arrival of a new message

(any valid examples 1 mark each * 3)

Question 6 [11]

6.1 What is the aim of design guidelines, standards and principles? (1)

P51 to help designers to **improve the usability of their products by giving them rules a**ccording to which they can make design decisions (Dix et al., 2004). ✓

6.2 Differentiate between design principles and usability principles. (4)

P 52 The difference between design principles and usability principles are that design principles usually informs the design of a system, ✓

while usability principles are mostly used as the basis for evaluating prototypes and complete systems (Preece et al., 2007). ✓

Usability principles can be more prescriptive than design principles. ✓

When used in practice, some design or usability principles are referred to as heuristics (Preece et al., 2007). ✓

6.3 Dix et al. (2004) divided interface design principles into three categories: learnability, flexibility and robustness. Identify THREE (error was fixed via announcement from four to three) **principles that relate to learnability principles.** **(6)**

P53 (1 mark per principle * 3 and 1 mark per explanation * 3 = 6)

Table 3.2 Principles that relate to Learnability principles

Principle	**Explanation**
Operation visibility✓	The way in which the availability of possible next operations are shown to the user and how the user is informed that certain operations are not available. ✓
Honesty✓	The ability of the user interface to provide an observable and informative account of any change an operation makes to the internal state of the system. It is immediate when the notification requires no further interaction by the user. It is eventual when the user has to issue explicit directives to make the changes observable. ✓
Guessability and affordance✓	The way the appearance of the object stimulates a familiarity with its behaviour or function. ✓

Question 7 **[3]**

Provide one word for the following definitions:

7.1 The ease with which users can enter a new system and reach a maximum level of performance. **Learnability✓ p52**

7.2 The many ways in which interaction between the user and the system can take place. **Flexibility ✓ p53**

7.3 Refers to the level of support the user is given for successful achievement and assessment of their goals. **Robustness ✓ p54**

Question 8 **[10]**

8.1 Name 5 different types of interfaces. **(5)**

P62 (any 5 valid interfaces 1 mark each there is 11)

Advanced Graphical Interfaces✓

Web-Based Interfaces✓

Speech Interfaces✓

Pen, Gesture and Touchscreen Interfaces✓

Mobile Interfaces✓

Multimodal Interfaces

Shareable Interfaces

Tangible Interfaces

Augmented and Mixed Reality Interfaces

Wearable Interfaces

Robotic Interfaces

8.2 You are expected to go out into the community for example a school in area or an old age home. Indicate what advantages are associated with each type of interface taking into consideration the type of community selected. In your answer clearly indicate which community you involved. (5)

P62 Depending on the type of environment selected by student school or old age home – the user is supposed to list the advantages that would be associated with the environment and type of interface chosen in 8.1

Type of interface	**Advantage of interface type – old age homes**	**Advantage of interface type – in school**
Advanced Graphical Interfaces	Visibility Graphical displays can be used to represent complex relationships in data sets that would not, otherwise, have been apparent – especially with elderly people that finds it difficult to read text.	Impact and animation: Graphical images have a greater intuitive appeal than text-based interfaces, especially if they are animated – in school environments animation will be more appealing for school children when interacting with systems.
Web-Based Interfaces	Web-based interfaces provides users with access to large volumes of information at the click of a button. Sophisticated search engines such as Google makes it easy to search for information on specific topics. Elderly people can do online banking, skype or be in contact with family through web-based interfaces	Web-based interfaces will allow school learners to access information and work from home or while not at school premises. Teachers can be in contact with students teaching online using web-based interfaces.

	especially if they are bound to a bed or a location and experiencing problems with travelling – it allows them access to far off places and people.	
Speech Interfaces	It allows the user to talk to a system that has the capacity to interpret spoken language. It is commonly used in systems that provide specific information (e.g. flight times) or perform a specific transaction (e.g. buy a movie ticket). Technology such as speech enabled screen readers and speech operated home control systems (e.g. for switching appliances on and off) can be especially helpful to people with disabilities especially elderly people.	It allows the user to talk to a system that has the capacity to interpret spoken language. It is commonly used in systems that provide specific information (e.g. test or exam time tables or results) or perform a specific transaction (e.g. buy a movie ticket). Technology such as speech enabled screen readers and speech operated home control systems (e.g. for switching appliances on and off) can be especially helpful to people with disabilities especially young people in school environments
Pen, Gesture and Touchscreen Interfaces	Personal digital assistants (PDAs) come with a pen for making on-screen selections, or to write or sketch freehand. Objects can also be manipulated through swiping or stroking gestures. Pen-based interfaces are also suitable for large displays – especially with elderly people struggling with vision impairedness. Through a process called 'digital ink' that uses sophisticated handwriting recognition and conversion techniques, text written on a PDA screen or tablet PC, for example, can be converted into	PDA can be used in multiple choice online assessment to choose correct options. Learners with vision problems can use Pen-based interfaces are also suitable for large displays – to enlarge font of work they need to view in school environment. Teachers can use 'digital ink' to verify that it is actually the student completing a test – using sophisticated handwriting recognition and conversion techniques, text written on a PDA screen or tablet PC, for

	digital text. Gesture-based input involves camera capture and computer vision to detect people's arm and hand gestures. This makes sign language interpreting systems possible. The latest systems use sensor technologies to detect touch, bend and speed of movement. Touchscreens allow users to manipulate screen objects with their fingers. Two hands can, for example, be used to stretch an object in two different directions at the same time. These kinds of interfaces can increase the speed and accuracy of input, and users use natural gestures to interact. They also provide options for users who may have difficulty using the mouse and keyboard	example, can be converted into digital text. Gesture-based input involves camera capture and computer vision to detect people's arm and hand gestures can be used in simulations in school environments or in virtual learning environments – to manipulate movements and actions.
Mobile Interfaces	These are interfaces designed for handheld devices such as cell phones that are intended for use on the move. The space limitations compel designers to use buttons for multiple purposes. For example a single key on a cell phone can represent up to five characters and each is associated with a predefined number of presses of the key	Learners in schools might have mobile devices that can be used to interact with school activities, homework reminders or allowing access to study material.
Multimodal Interfaces	They allow more flexible interaction and can support users such as elderly people with disabilities.	Multimodal interfaces can be used in schools that have disabled children.

Shareable Interfaces	Shareable interfaces provide large interactional space and supports flexible group work and sharing of information	Schools can use shareable interfaces where learners for study groups for and share experiences and/or support one another in the learning process.
Tangible Interfaces	Tangible interfaces might not be a good option for elderly people in old age homes.	Tangible interfaces have been used for urban planning and storytelling technologies, and are generally good for learning, design and collaboration. Tangible interfaces are particularly suitable for young children
Augmented and Mixed Reality Interfaces	Not relevant and suitable to old age homes not recommended to implement.	These interfaces may enhance perception of the real-world, and can thereby support training and education (for example, in flight simulators).
Wearable Interfaces	These interfaces involve input and output devices that are integrated with normal apparel, such as headgear or spectacles. They are mobile and less restrictive than desk-based technologies or even mobile technologies. They can create a sense of realism, and provide a means of immediate feedback. This immediate feedback can be especially helpful in the detection of medical conditions. Wearable interfaces can come in very handy with disable people that needs to control for example a keyboard with eye movement – to tell people around them what they need or want. Good example for disabled people in wheel	These interfaces involve input and output devices that are integrated with normal apparel, such as headgear or spectacles – for use with disable children or in simulations etc.

	chair or in bed.	
Robotic Interfaces	Robots are computational devices that have the physical appearance and behaviours of humans or animals. They can be built to go into places too small or dangerous for humans, or for manual repetitive tasks. Domestic robots can be manipulated to help in the house and they can be especially useful for the disabled. Pet-like robots have been developed to host events or act as companion. It can be used in elderly homes with people that are in wheel chairs that needs someone or something to pick up things that were dropped or to take things to and from – for example a class off water from basin to couch	Robots can be used very useful in school environments especially with disabled children.

Question 9 **[3]**

Name and discuss 3 disadvantages of social networking sites.

1. Lack of anonymity or privacy – which will allow users to access private information without permission. ✓
2. Identity theft – some people place enough information on these sites to allow others to get all the necessary information to assume that identity. ✓
3. It wastes time, to such an extent that some companies block access to these sites during working hours. ✓
4. Mining of users' data for advertising purposes.
5. Cyberbullying – it is much easier to harass someone through an online network than it is in the real world.
6. Cyberstalking.
7. Inappropriate content such as political propaganda. Countries such as Syria, China, Iran, and Vietnam have banned the use of Facebook.

(any 3 valid disadvantages discussed)

Question 10 **[3]**

Describe blogs and what they are used for.

Blogs are like online journals. ✓

Individuals use blogs as diaries or to comment on specific topics. ✓

Some allow readers to post responses. ✓

Blogs are also popular amongst children.

In 2009, 24% of all children between 9 and 16 in the United Kingdom had their own blog (New Scientist, 12 December 2009).

(any 3 valid descriptions of blogs)

End of Assignment 2
