

THE UNIVERSITY OF AUCKLAND

FIRST SEMESTER, 2011

Campus: City

**COMPUTER SCIENCE
&
SOFTWARE ENGINEERING**

Human Computer Interaction

(Time allowed: 50 minutes)

NOTE: Answer ALL questions.

This test contributes 15% to your final grade.

Write your answers **legibly** on this paper.

Overflow space is available at the end of the test paper, indicate at the end of the original question if you are using overflow space.

Question	Out of	Marks
1	9	
2	10	
3	6	
4	10	
5	8	
6	5	
7	6	
8	6	
TOTAL	60	

Name:	UPI:	ID:
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1. The Augmented Reality interaction paradigm

- a) List two characteristics of Augmented Reality that distinguish it from Virtual Reality [2 marks]

AR integrates the real world with virtuality
AR is in synch with the real world

- b) Augmented Reality is increasingly being accessed through mobile devices. Give two reasons why the desktop metaphor is not being used for this interaction paradigm. [4 marks]

You can't manipulate the real world objects like a desktop
There is limited screen space in an AR view

- c) In the Augmented Reality application shown below identify three interactive elements within the application and describe the affordances each one offers.



[3 marks]

Buttons afford pushing
Zoom control afford sliding up and down
Compass wheel afford turning or spinning

2. Scenarios

In Assignment 1 you developed scenarios for the project manager functions of the application. Consider the functions required by the **meeting convener** and detail a scenario (including PACT analysis) for successfully logging a meeting between the *architect* and *client* to sign-off the completion of the building.

[10 marks]

Name: Signing off the completion of the building

People: Meeting convener, architect and client

Activities: Using the mobile application to log a sign-off meeting

Context: On site as an independent activity

Technology: Mobile device

Description: It is a gray and blustery day with cool temperatures. Not a day that you would want to be standing around outside for too long. The building has been completed, which is a major occasion for the project, and once signed off it will be a source of celebration for all involved in the project. The meeting convener arrives first at the entrance to the new building and is joined by the client and architect. The meeting convener gets out a mobile device and starts up the Digital Fieldnotes application. Using the application they chose to create a new sign-off meeting for the current location. The names of the architect and client and selected from the list of potential meeting attendees as the only attendees of the meeting. The subject of the meeting is selected as Building from the list of potential objects. The meeting convener then confirms the saving of this meeting to the database and quits the application.

3. The design life-cycle

Orion Health's user experience team use a standard design life-cycle for projects. The majority of the team's work is in the stages they call 'elaborate' and 'design'. Describe how low-fidelity prototyping fits into this life-cycle.

[6 marks]

A couple of marks for remembering what Orion does in Elaborate and Design phases, then the other 4 for the description.

- Elaborate – user interviews, persona creation, lo-fi
- Design – lo-fi -> high fi
- Development – support for development and testing
- Release – support for client requests

After requirements gathering by interviewing users/clients and clinical support the team develop personas then develop lo-fi prototypes with Balsamic. The lo-fi prototypes are low cost, used to communicate ideas quickly, allow them to make mistakes. They also form part of the storyboards. From the lo-fi they develop the wire-frames and adopt design patterns. After, possibly multiple iterations, the lo-fi is converted to a hi-fi for the developers to work from.

4. Heuristic evaluation

Imagine you are visiting Telecom's site to purchase a broadband package to encompass both your mobile phone and your home line. The entry screen of the Telecom site is as below. Perform a heuristic-based evaluation of the usability of this entry page for this function (based on Nielsen's 10 Usability Heuristics).

[10 marks]

- 1) Visibility of system status: Not really possible to ascertain in this screen.
- 2) Match between system and the real world: Some mismatch here with terminology which is specific to Telecom (e.g., postpaid). Layout is mostly in catalogue form which provides a match between real-world and page layout.
- 3) User control and freedom: Provides top level navigation bar that is presumably always visible.
- 4) Consistency and standards: Following many conventions with search on top right, use of top navigation bar, site specific functions at the bottom, etc. Fairly standard use of buttons, text-boxes, etc.
- 5) Error prevention: Most functions are accessed by navigation, so full control by Telecom system. Text-boxes mostly for generic search rather than specific data entry, so not creating points that errors could occur.
- 6) Recognition rather than recall: Most everything is written and visible at this level, so user doesn't have to recall pathways. However, some terminology is unclear, and not always replicated where it would be useful (e.g., email under business but not under at home).
- 7) Flexibility and efficiency of use: Not really possible to ascertain in this screen. User can log in which would indicate that there is some user specific tailoring offered.
- 8) Aesthetic and minimalist design: Using small number of fairly intuitive groupings of functions, not overloading user with choices.

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9) Help users recognize, diagnose, and recover from errors: Not really possible to ascertain in this screen.

10) Help and documentation: Help available in a number of places (top navigation, bottom functions, and beside remember me check box). Could use a help icon at top right as per normal conventions rather than requiring a scan of text functions, or put help at far right of functions as seen in most applications.

5. Gestalt principles of perception

Look at the webpage below which is taken from the Telecom website. Indicate which Gestalt principles are being used in the design and where this is evident in the webpage.

[8 marks]

The screenshot shows a web browser window displaying the Telecom New Zealand mobile phone store. The page is titled "Postpaid Phones" and features a grid of six mobile phones for sale. Each phone is accompanied by its price and model name. The phones are arranged in two rows of three. The first row includes an LG C900k Optimus7Q (\$899.00), an LG Optimus One P500 (\$449.00), and a Nokia 3710 Purple (\$399.00). The second row includes a Nokia C5-00 (\$399.00), a Nokia E5-00 (\$499.00), and a Telecom R54 (\$399.00). The phones in the first row have "NEW!" labels. To the left of the phone grid is a "Filter By" section with checkboxes for "Special Offer", "Price" (ranging from \$0-\$500 to over \$1000), and "Brand" (including BlackBerry, Garmin-Asus, HTC, LG, Motorola, Nokia, Samsung, Sony Ericsson, and Telecom). Below the "Filter By" section is a "Features" section with checkboxes for various features like Windows 7 OS, Android OS, Camera, Email, GPS, Maps, Touch screen, Wi-Fi, Best for Games, Best for Music, Best for Photos, and Best for Work. To the right of the phone grid is a "Your Cart" section (empty), a "Compare Phones" section, a "SPECIAL OFFERS" section, a "Buy online or call" section (0800 662 435), a "4 reasons to buy online" section (including "Free delivery"), and a "Convenience" section. The page also includes a search bar, navigation links, and a footer with "Internet | Protected Mode: On" and a 100% zoom level.

Proximity: Can see both horizontal and vertical proximity in use with check boxes down the page forming distinct groups of options and radio buttons across the page.

Similarity: Evident in the phone pictures with similar shape and structure for each phone showing they belong together. Also with check boxes down the page forming groups for particular filters.

Common Fate: Related items will again be check-boxes down the screen all aligned with each other indicating that they work towards the same goal.

Closure: Filter section is enclosed showing it is contributing to a common function. A number of the functional areas of the webpage are enclosed to indicate distinct functions.

Good Continuity: No real use of this feature visible.

Area: phones in the centre have a smallish area so likely to be seen as the figure within the centre of the screen.

Symmetry: Not very much shown, perhaps the left and right-hand side sections of the screen reflect around the central area.

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Surroundedness: Phones in the centre are surrounded by text and filters, so will be seen as the figure of the layout.

Prägnanz: Not really visible here.

6. Stakeholders

For the following website for booking airline tickets list the stakeholders for the system in each of the four categories.

[5 marks]

The screenshot shows the Qantas website interface. The main navigation bar includes Home, Plan, Book, Fly, Frequent Flyer, About Qantas, and Help. A search bar is located in the top right. Below the navigation, there is a section for 'Flights' with options for Return, One Way, Multi-City, and Round the World. The flight search form is set for Auckland to Melbourne, departing in March 2011. A prominent red banner advertises a 'Global Roaming Sale from Auckland' with prices for Bangkok (NZ\$1399*), Mumbai (NZ\$1675*), and Johannesburg (NZ\$2329*). The footer contains links for Contacts, Privacy & Security, Terms of Use, Viewing Tips, and Worldwide Sites, along with the Jetstar logo and copyright information for Qantas Airways Limited.

Primary: general public

Secondary: flight timetabling; advertising; sales; bookings; helpdesk; hotels; car hire companies

Facilitator: IT support; design team

Indirect: Qantas management; banks (for credit card payments)

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7. Interface style advantages

Imagine that you want to select a song to play from your music collection on your laptop. Discuss the advantages of a Menu-based interface versus a Direct Manipulation interface for this task.

[6 marks]

Menu-based

easy to understand affordances
all based on recognition
single pathway to the goal

Direct manipulation

more flexible for large lists
multiple pathways to get to songs
can provide spatial cues for the task

8. Interface style abilities

Consider the abilities of Natural Language Interfaces versus Command Line Interfaces. Specify environments and tasks which would be better suited for each of these interface styles.

[6 marks]

Command line

tasks that need to be performed quickly and precisely
tasks with a lot of repetition
tasks undertaken by experts
tasks undertaken in rooms with controlled lighting

Natural language

tasks that need hands free input
tasks where the user should not be looking at screens for output (e.g., car navigation)
tasks in poor lighting conditions
useful for mobile systems
tasks where there is little impact on others (e.g., at home)
tasks which need to be easy to learn, for beginners
tasks where you want many ways of achieving the outcome

