INTI
INTERNATIONAL COLLEGE PENANG (507232-U)
LAUREATE INTERNATIONAL UNIVERSITIES

FINAL Examination Paper

(COVER PAGE)

Session : Aug 2012

Programme : DIPLOMA IN INFORMATION TECHNOLOGY

Course : CSC 2117: INTRODUCTION TO HUMAN-COMPUTER INTERACTION

Date of Examination :

Time : Reading Time : Nil

Duration : 2 Hours

Special Instructions :

This paper consists of SIX (6) questions. Answer any FOUR (4) questions in the answer booklet provided. All questions carry equal marks.

Materials permitted : Nil

Materials provided : Answer Booklet

Examiner(s) : **Lim Chai Kim**

Moderator :

This paper consists of _4__ printed pages, including the cover page.

INTI INTERNATIONAL COLLEGE PENANG

DIPLOMA IN INFORMATION TECHNOLOGY PROGRAMME (DIT/I)

CSC2117: Introduction to Human-Computer Interaction
FINAL EXAMINATION: AUGUST 2012 SESSION

Instructions: This paper consists of **SIX (6)** questions. Answer any **FOUR (4)** questions in the answer booklet provided. All questions carry equal marks.

Question 1

(a) List the **FOUR (4)** components involved in the interaction between a human and a computer.

(4 marks)

(b) Describe **THREE (3)** differences between HCI Guidelines and HCI Principles in general.

(6 marks)

(c) Give **FOUR (4)** HCI Guideline examples.

(4 marks)

(d) The "8 golden rules of interface design" is one of HCI's fundamental principles. List the **EIGHT (8)** rules.

(8 marks)

(e) Contextual Theories are alternative theories against tightly controlled laboratory studies of isolated phenomena. Name **THREE (3)** example contextual factors that will affect a user's interaction with the computer that are NOT considered in tightly controlled laboratory studies.

Bold

(3 marks)

Question 2

(a) Participatory Design is the direct involvement of people in the collaborative design of the things and technologies they use. More user involvement brings more accurate information about tasks and an opportunity for users to influence design decisions. However, there is a controversial side of Participatory Design. Describe **THREE (3)** possible disadvantages of Participatory Design.

(6 marks)

(b) The 2nd of the 4 Pillars of Design is "Guideline Documents and Processes". List **FIVE (5)** recommendations for how guideline documents should be managed.

(10 marks)

(c) List and briefly explain **TWO (2)** factors that affect evaluation plans.

(4 marks)

(d) List **FIVE (5)** expert review methods.

(5 marks)

Question 3

(a) Explain **FIVE (5)** benefits that may result from using Direct Manipulation Interface.

(10 marks)

(b) List **FOUR (4)** interface styles that are more advanced type of Direct Manipulation.

(4 marks)

(c) List and describe **THREE (3)** of the most basic type of single menu.

(6 marks)

With the aids of diagrams,

(d) Explain the difference between a tree menu structure and network menu structure. ~~Also draw the diagram for each of the structure~~.

(5 marks)

Question 4

(a) Describe **THREE (3)** differences between Command Language and Menu Selection Systems

(6 marks)

(b) List **FIVE (5)** out of the seven basic goals of language design in general.

(5 marks)

(c) List **THREE (3)** Keyboard Layout types

(3 marks)

(d) List **FIVE (5)** keyboards or text entry methods designed for small devices.

(5 marks)

(e) Explain **THREE (3)** reasons speech recognition still does not match the fantasy of science fiction.

(6 marks)

Question 5

(a) Draw the Time/Space four-quadrant matrix model of group-supported work

(18 marks)

(b) The umbrella term "Quality of Service" is about the complex set of concerns regarding computer speed and response time. List **THREE (3)** factors that affect computer speed.

(3 marks)

(c) List **FOUR (4)** criteria for users to achieve rapid task performance, low error rates and high satisfaction.

(4 marks)

Question 6

(a) Explain **FIVE (5)** ways in which error messages can become disasters. (10 marks)

(b) Explain **FIVE (5)** non-anthropomorphic design guidelines. (10 marks)

(c) List **FIVE (5)** advantages for making printed manuals available online. (5 marks)

--THE END--

(CSC2117/F/LimChaiKim/Aug2012)

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Instructions: This paper consists of **SIX (6)** questions. Answer any **FOUR (4)** questions in the answer booklet provided. All questions carry equal marks.

Question 1

(a) List the **FOUR (4)** components involved in the interaction between a human and a computer.

Marking scheme:
- 10 sub-points X 1m = 10m

Sample answer (Student's answer may vary)
i. the human or user
ii. the task or job to be done
iii. the context where the interaction takes place
iv. the computer system

(4 marks)

(b) Describe **THREE (3)** differences between HCI Guidelines and HCI Principles in general.

Marking scheme:
- 3 differences X 2m = 6m

Sample answer (Student's answer may vary)
i. HCI Guidelines are narrowly focused, while HCI Principles are more fundamental.
ii. HCI Guidelines are more specific in application, while HCI Principles tend to be more widely applicable.
iii. HCI Guidelines are less enduring, while HCI Principles are more enduring.
iv. HCI Guidelines need less clarification, while HCI principles tend to need more clarification.

(6 marks)

(c) Give **FOUR (4)** HCI Guideline examples.

Marking Scheme:
4 examples X 1m = 4 marks

Sample answer (Student's answer may vary):
i) Navigating the interface
ii) Organizing the Display
iii) Getting the user's attention
iv) Facilitating data entry

(4 marks)

(d) The "8 golden rules of interface design" is one of HCI's fundamental principles. List the EIGHT (8) rules.

Marking Scheme:
8 rules X 1m = 8 marks

Answer :

1. Strive for consistency
2. Cater to universal usability
3. Offer informative feedback
4. Design dialogs to yield closure (organize sequence of actions)
5. Prevent errors
6. Permit easy reversal of actions
7. Support internal locus of control (user controlling the system features)
8. Reduce short term memory

(8 marks)

(c) Contextual Theories are alternative theories against tightly controlled laboratory studies of isolated phenomena. Name THREE (3) example contextual factors that will affect a user's interaction with the computer that are NOT considered in tightly controlled laboratory studies.

Marking Scheme:
3 example factors X 1m = 3 marks

Answer (any 3):

1. colleagues nearby that they can ask for help
2. reference documents
3. unexpected interruption
4. sticky notes attached to the side of computer monitors.

(3 marks)

Question 2

(a) Participatory Design is the direct involvement of people in the collaborative design of the things and technologies they use. More user involvement brings more accurate information about tasks and an opportunity for users to influence design decisions. However, there is a controversial side of Participatory Design. Describe THREE (3) possible disadvantages of Participatory Design.

Marking Scheme:
3 disadvantages X 2m = 6 marks

Suggested answer (any 3):
Extensive user involvement may:
1) be more costly
2) lengthen the implementation period
3) conflict with people not involved or whose suggestions rejected
4) force designers to compromise their design to satisfy incompetent participants
5) build opposition to implementation
6) personality conflicts between design-team members and users
7) show that organizational politics and preferences of certain individuals are more important than technical issues

(6 marks)

(b) The 2nd of the 4 Pillars of Design is "Guideline Documents and Processes". List **FIVE (5)** recommendations for how guideline documents should be managed.

Marking scheme:
- 5 recommendations X 2m = 10m

Proposed answer (any 5):
1) Provide a social process for developers
2) Record decisions for all parties to see
3) Promote consistency and completeness
4) Facilitate automation of design
5) Allows multiple levels:
   a) Rigid standards
   b) Accepted Practices
   c) Flexible guidelines
6) Announce policies for:
   a) Education: How to get it?
   b) Enforcement: Who reviews?
   c) Exemption: Who decides?
   d) Enhancement: How often?

(10 marks)

(c) List and briefly explain **TWO (2)** factors that affect evaluation plans.

Marking Scheme:
2 factors X 1m = 2 marks.
2 brief explanation X 1m = 2 marks.

Answer (Student's answer may vary). Any 2:

i) **Stage of design** - whether early, middle or late stage.
ii) **Novelty/newness of project** - whether the project is well defined or exploratory.
iii) **Number of expected users** – how many users will be using the system.
iv) **Criticality of the interface** - life-critical medical system or museum exhibit support.
v) **Costs of product and finances allocated for testing** – what is the budget allocated for testing.
vi) **Time available** – how much time is available for planning and carrying out the evaluation.
vii) **Experience of the design and evaluation team** – how experienced are the evaluation team members.

(4 marks)

(d) List **FIVE (5)** expert review methods.

Marking scheme:
◦ 5 methods X 1m = 5m

Answer (any 5):

i. Heuristic evaluation
ii. Guidelines review
iii. Consistency inspection
iv. Cognitive walkthrough
v. Metaphors of human thinking (MOT)
vi. Formal usability inspection

(5 marks)

Question 3

(a) Explain **FIVE (5)** benefits that may result from using Direct Manipulation Interface.
Marking Scheme
◦ Explain 5 benefits X 2m = 10m

Proposal answer (Student's answer may vary)

i. Novices learn quickly
ii. Experts work rapidly
iii. Intermittent users can retain concepts
iv. Error messages are rarely needed
v. Users see if their actions are furthering their goals
vi. Users experience less anxiety
vii. Users gain confidence and mastery

(10 marks)

(b) List **FOUR (4)** interface styles that are more advanced type of Direct Manipulation.

Marking Scheme:
4 styles X 1m = 4m

Answer:
i) TeleOperation
ii) 3D Interface
iii) Virtual Reality
iv) Augmented Reality

(4 marks)

(c) List and describe **THREE (3)** of the most basic type of single menu.

Marking scheme:
3 types of basic single menu X 1m = 3m
3 brief description X 1m = 3m

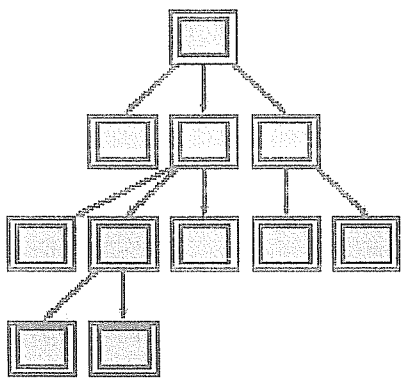
Proposed answer:
1) **Binary Menus**. This is the type of menu where the user is given 2 choices only. For example:
   a) Button Choice (OK, Cancel)
   b) Radio Buttons (Male, Female)
2) **Multiple-item Menus**. This is usually a list of radio buttons that users can select one choice only.
3) **Multiple-selection menus**. This is usually a list of check boxes that the user can select more than one choice.

(6 marks)

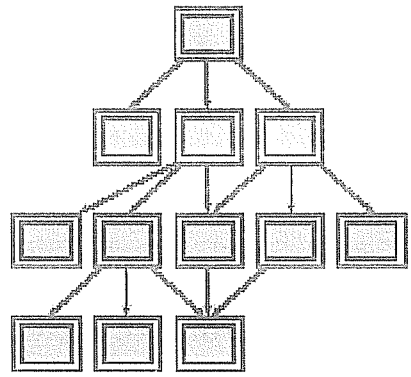
(d) Explain the difference between a tree menu structure and network menu structure. Also draw the diagram for each of the structure.

Marking Scheme:
Explanation - 2
Diagram - 1.5 X 2

The difference is that in a tree structure menu, there is only 1 path to reach a lower level menu item. A lower level menu item will not have 2 or more parent menu, only 1 parent. Whereas, in a network menu structure, there could be more than 1 path to reach a lower level menu item. A menu may have more than one parent menu.



Tree Structure Menu



Network Structure Menu

(5 marks)

Question 4

(a) Describe **THREE (3)** differences between Command Language and Menu Selection Systems

Marking scheme:
- 3 differences X 2m = 6m

Proposed answer:

Command Language	vs. Menu Selection
Users recall notation & initiate action	Users respond more than initiate
Requires memorization & typing	Less memorization & typing
Error prone	Less error

(6 marks)

(b) List **FIVE (5)** out of the seven basic goals of language design in general.

Marking Scheme:
- List 5 goals X 1m = 5m

Proposed answer (Student's answer may vary). Any 5:

i. Precision
ii. Compactness
iii. Ease in writing and reading
iv. Completeness
v. Speed in learning
vi. Simplicity to reduce errors
vii. Ease of retention over time

(5 marks)

(c) List **THREE (3)** Keyboard Layout types

change to 1m

Marking Scheme:
3 layout X 1m = 6m 3m

Proposed answer:
1) QWERTY Layout
2) Dvorak Layout
3) ABCDE Layout

(3 marks)

(d) List **FIVE (5)** keyboards or text entry methods designed for small devices.

Marking Scheme:
5 methods X 1m = 5 marks

Proposed answer (any 5):
(1) Wireless or foldable keyboards
(2) Virtual keyboards
(3) Cloth keyboards
(4) Numeric keypads -> Multi-tap system, Soft keys
(5) Predictive techniques e.g. T9® by Tegic Communications
(6) Stylus – handwrite
(7) Touchscreens

(5 marks)

(e) Explain **THREE (3)** reasons speech recognition still does not match the fantasy of science fiction.

Marking Scheme:
3 reasons X 2m = 6 marks

Answer:
i. demands user's working memory
ii. background noise problematic
iii. variations in user speech performance impacts effectiveness
iv. most useful in specific applications, such as to benefit handicapped users

(6 marks)

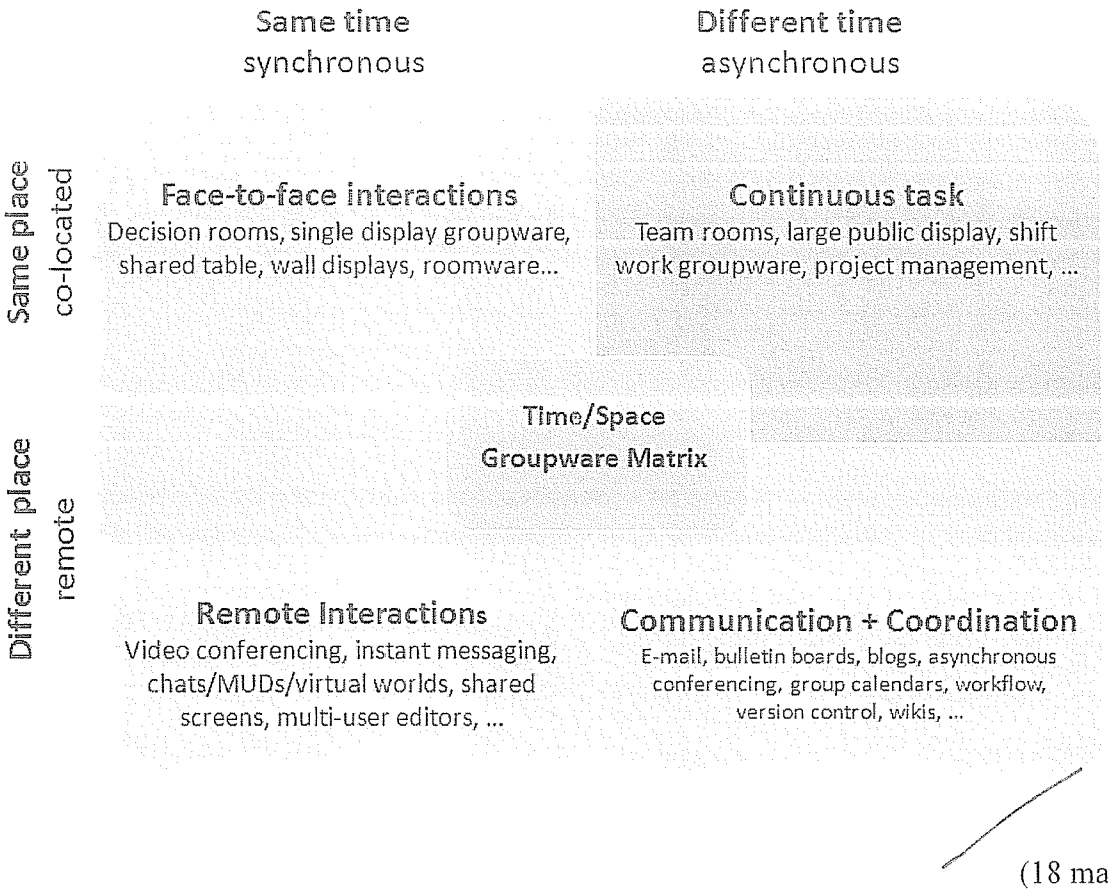
Question 5

(a) Draw the Time/Space four-quadrant matrix model of group-supported work

Marking Scheme:

- 17 elements of model X 1mark = 17 marks
- Drawing of 4 quadrant matrix X 1 mark = 1 marks

Proposed answer:



(18 marks)

(b) The umbrella term "Quality of Service" is about the complex set of concerns regarding computer speed and response time. List **THREE (3)** factors that affect computer speed.

Marking Scheme:
3 factors X 1m = 3m

Suggested answers (any 3):
1) mathematical computations
2) program compilation
3) database searches
4) server load
5) network congestion
6) dropped connection
7) unavailable website
8) network outages

(3 marks)

(c) List **FOUR (4)** criteria for users to achieve rapid task performance, low error rates and high satisfaction.

Marking Scheme:
4 criteria X 1m = 4m

Proposed answer (any 4):

i. Users have adequate knowledge of the objects and actions necessary for the problem-solving task
ii. The solution plan can be carried out without delay
iii. Distractions are eliminated
iv. User anxiety is low
v. There is feedback about progress towards the solution
vi. Errors can be avoided or, if they occur, can be handled easily

(4 marks)

Question 6

(a) Explain **FIVE (5)** ways in which error messages can become disasters.

Marking Scheme:
5 ways X 2m = 10 marks

Proposed answer (student's answer may vary):

(1) Error messages written by multiple authors are too obvious that they are by multiple authors.
(2) Bizarre and misleading
(3) Critical and humorous
(4) Too generic
(5) International user interface: translation done directly from isolated resource files.

(10 marks)

(b) Briefly explain **FIVE (5)** non-anthropomorphic design guidelines.

Marking Scheme:
5 guidelines X 2m = 10 marks

Proposed answer (student's answer may vary):

(1) Error messages written by multiple authors are too obvious that they are by multiple authors.
(2) Bizarre and misleading
(3) Critical and humorous
(4) Too generic
(5) International user interface: translation done directly from isolated resource files.

(10 marks)

(c) List **FIVE (5)** advantages for making printed manuals available online.

Marking Scheme:
5 reasons X 2 marks = 10 marks

Proposed answer (student's answer may vary). Any 5:

Physical Advantages:
i) Information is available whenever the electronic device or the computer is available. Many users lose their paper documentation or do not keep it current with new versions of the software.

ii) Users do not need to allocate physical workspace to opening up the documentation. Paper documentation can be clumsy to use and can clutter workspace.

iii) Information can be electronically updated rapidly and at low cost. Electronic dissemination of revisions ensures that out-of-date material cannot be retrieved inadvertently.

Navigation features:
iv) Specific information necessary for a task can be located rapidly if the online documentation offers indexes, tables of content, list of figures, glossaries and list of keyboard shortcuts.

v) Searching for one page in hundreds can usually be done much more quickly on a computer than with paper documentation.

vi) Linking within texts can guide readers to related materials; linking to external materials such as dictionaries, encyclopedias, translations and web resources can facilitate understanding.

Interactive services:
vii) Readers can bookmark and annotate or tag the text and send text and annotations by e-mail.

viii) Authors can use graphics, sound, color and animations that may be helpful in explaining complex actions and creating an engaging experience for users.

ix) Readers can turn to newsgroup, listservers, online communities, e-mail, chat and instant messaging for further help from other users.

x) Visually impaired users (or users needing a hands-free mode) can use screen readers and listen to instructions.

Economic advantages:
xi) Online documentation is cheaper to duplicate and distribute than paper documentation.
(5 marks)

--THE END—
(CSC2117/F/LimChaiKim/Aug2012)