



**UNIVERSITY OF COLOMBO, SRI LANKA**



**UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING**



**DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)**

***Academic Year 2008/2009 – 3<sup>rd</sup> Year Examination – Semester 5***

***IT5103: Professional Issues in IT***

***Structured Question Paper***

***16<sup>th</sup> May, 2009***

***TWO HOURS***

**To be completed by the candidate**

BIT Examination Index No: \_\_\_\_\_

**Important Instructions:**

- The duration of the paper is **2 (Two) hours**.
- The medium of instruction and questions is English.
- This paper has **4 questions** and **15 pages**.
- **Answer ALL questions.** (all questions **do not** carry equal marks)
- **Write your answers** in English using the space provided **in this question paper**.
- Do not tear off any part of this answer book. Under no circumstances may this book, used or unused, be removed from the Examination Hall by a candidate.
- Note that questions appear on both sides of the paper.  
If a page is not printed, please inform the supervisor immediately.

**Questions Answered**

Indicate by a cross (X), e.g. 

X
---

 the question numbers of the questions answered.

To be completed by the candidate by marking a cross (X).				
	1	2	3	4
To be completed by the examiners:				

### **Case Study**

The Health Ministry of Sri Lanka is in the process of carrying out discussions in order to introduce an electronic health card to all citizens of Sri Lanka. This card will contain the health related information of each person in addition to identification information. Every time a patient goes to a hospital, the card will be updated where necessary. Each consultant in each hospital will have to have a card reader to read the patient information. A pilot project was carried out in the National Hospital, Colombo to assess the feasibility of this project. The web based system developed for electronic patient record management will have different levels of access rights for the following parties.

- a) Patients – Read only access to their own health records for informal matters. A doctor's signature is necessary for certification, for official purposes.
- b) Government Doctors – All doctors who treat patients will have read/ write access to their own patient's records. No deletion rights are granted to any record for security or Medico- Legal purpose. Every modification will be appended to the existing record.
- c) Government Health care institutions – They will be given access to view and update the patient records. Here, no deletion rights are granted.
- d) Private Health care institutions – They will have to pay an annual subscription to access the patient records. These institutes will only have rights to view records.
- e) Health Ministry of Sri Lanka - The ministry reserves the right to use this data for statistical purposes, whenever the need arises, for the benefit of the society.

The project will cost over Rs 30 million to implement the solution in the Western Province alone. The system is being developed by a Sri Lankan software development company, called ICT4U, after studying the requirements carefully. ICT4U is in the process of developing the software within two years. They are finding this a challenging task and are thinking of outsourcing some of the modules to another company. ICT4U is also responsible for the data entry of 50,000 patient records, which need to be kept very confidential since a blackmailer or an insurance agent could try to get unauthorized access to confidential medical records.

Once completed, the system will be handed over to the Ministry of Health where the server will be maintained and managed. The administrator of the system will be a person at the director level, working at the Ministry of Health. The hospital trade unions and patients are concerned about the following aspects of the system.

- i. Privacy and confidentiality of patient health records
- ii. Access rights given to private sector institutions
- iii. The benefit of the system to the health sector compared to the cost incurred
- iv. Recovery of the cost incurred in installing and maintaining the system
- v. The person who has final administrative rights of the proposed system and his/her credibility
- vi. The fear of insurance companies getting hold of patient information
- vii. The problem of patients losing their cards and making the medical information in the card vulnerable for others to read

The Ministry also wants to incorporate a monitoring system for e-mails and system related activities into the web based system to ensure that no employee misuses the information in the database for unlawful or unethical purposes. The administrator will have the final authority to monitor the activities of all users of the system.

\*\*\*\*\*

- 1) (a) Describe how the Electronic Patient Record Management System can be used for unethical purposes by other parties. Explain the benefits to these parties and the risks to the patients.

(10 marks)

**ANSWER IN THIS BOX**

Insurance company

For health insurance claim, they may try to get confidential information through the EMR system on their clients.

Media

They may get hold of health status of celebrities and controversial information on important people affecting their privacy

Hackers

They may try to alter the information of patients creating complex health related issues annoy patients.

Private sector health care institution

For a nominal fee, they get access to health information of their patients which may be a threat to patient who want their privacy protected.

Health ministry

They have access to all information or may leak information to unauthorized parties.

For spreading viruses

Intentionally, spreading virus, worm

- (b) What are the precautionary measures which need to be incorporated to make the Electronic Patient Record Management System and the Electronic Health Card System secure in order to ensure patient privacy?

*(10 marks)*

**ANSWER IN THIS BOX**

- i. Create awareness among patients not to lose their card and not to give their card and not to give their password to any body.
- ii. It is obligation and an ethical decision not to reveal patient information to others by doctors and Health ministry officials
- iii. IT and internet security measure need to be incorporated to secure the system.
- iv. Password protection and authentication need to be in place.
- v. Access rights to different parties need to be strictly incorporated
- vi. The administrator rights need to be given to the right people.
- vii. An audit trail need to be maintained
- viii. A declaration form needs to be signed by all users that unethical or misuse of information will not happen.

Index No: .....

- (c) Clearly describe the access rights which need to be given to private sector institutions and how to incorporate secure access to the system.

*(05 marks)*

**ANSWER IN THIS BOX**

- i. The consultants in the private sector may need access rights to their patients – one by one payment basis
- ii. The patients need to give concept to this
- iii. The consultants have to separate login. Audit trails need to be maintained
- iv. IT securities measures need to be strictly incorporated with encryption facilities.

- 2 (a) What exclusive rights does the copyright law authorize the owner/client to carryout?

(05 marks)

**ANSWER IN THIS BOX**

- i. the rights to copy the code in order to execute the code
- ii. downloading a page from the web to view on computer or save
- iii. the rights to issue copies at the work to the public whether or not they any charged for it
- iv. the right – to adapt the work
- v. the rights – to translate the work from 1 language to another ( c to java or English to sinhala)
- vi. the rights are valid for 70 year after the death
- vii. of author

- (b) Describe grounds on which discrimination can occur using an example in respect of each.

(10 marks)

**ANSWER IN THIS BOX**

- i. **Sex**  
A woman does exactly the same job as a man but is paid less than he
- ii. **Race, colour, ethnic origin or nationality** a doctor. refuses to treat a Chinese  
patient on the grounds that he has no room for any more patients but then accepts an English patient
- iii. **Disability**  
Discriminate the patients showing their disabilities
- iv. **Sexual orientation**  
A comp advertises for secretary & automation rejects all the male applications.
- v. **Religion**  
Doctor refuse to treat because of religion or make force non religion activity
- vi. **Age**  
A comp advertises for a mature woman to act as the chief executive's personal assistant or a strong young man to work as a trainee 200 rupee
- vii. **geographical location**



- (c) By using the system described in the case study, can discrimination occur? Explain the instances, if applicable.

(08 marks)

**ANSWER IN THIS BOX**

i. **Sex**

Women photographs can be viewed or sell by health org staff

ii. **race, colour, ethnic origin or nationality or refuses to treat foreign**

Patient on the grounds that he has no room for way more patient to then accepts an lanka patients

iii. **Disability**

Discriminate the patients showing their disabilities

iv. **Sexual orientation**

v. **Religion**

Doctor refuses to treat religion or make force to do non religion activity

vi. **Age**

be bias to treat patients according to age

eg: special treatment for less 31 years

vii. **Income level, geographical location**

Health staff comes to know income level many misted the patients (unburden) like private practice

- 3 (a) When ICT4U delivers the system to the Ministry of Health, briefly explain what they have to deliver along with the source code.

(10 marks)

**ANSWER IN THIS BOX**

- i. command files for building the executable code from the source & for installing it
- ii. documentation of the design & of the code
- iii. reference manuals, training manuals & operations manuals
- iv. slow tools to help maintain code
- v. user training
- vi. training for the client maintained staff
- vii. test data & test results

(b) Describe the following aspects with respect to the Health project given in the case study.

- (i) Obligation of the client
- (ii) Acceptance Procedure
- (iii) Warranty and maintenance
- (iv) Arbitration
- (v) Termination of the Contract

(10 marks)

**ANSWER IN THIS BOX**

- |      |                                                                                                                                                                                                                                                                              |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| i.   | Provide document on aspects of the client's (health ministry) or the in which the system will run                                                                                                                                                                            |
|      | Provide access to appropriate member or staff from hospitals                                                                                                                                                                                                                 |
|      | Provide machine facilities                                                                                                                                                                                                                                                   |
|      | Provide accommodation, & secretarial face                                                                                                                                                                                                                                    |
|      | Provide data communication facility                                                                                                                                                                                                                                          |
| ii.  | the essence of the acceptance procedure is that of health ministry should provide a fixed set of acceptance tests & expected results & that successful                                                                                                                       |
| iii. | (iii) product has been accepted warranty period is offered within the warranty period if any error found is the slow & reported slow will be corrected free of charge<br>Once the warranty period is over the client's demand maintain will continue to be available request |
| iv.  | contracts often there for contain a clause saying that, in the event of dispute that they cannot solve themselves, the parties agree to accept                                                                                                                               |
| v.   | the client to be taken over the by another comp that already has a system of the type being developed (policy on the port) It is essential, therefore<br>That the contract mark provision for terminate the work in on amicable manner.                                      |

- (c) As this is an outsourced project, briefly describe the important points which need to be addressed in the contract between the company ICT4U and the Ministry of Health.

*(08 marks)*

**ANSWER IN THIS BOX**

- i. How is performance to be monitored & managed
- ii. What happens if performance is unsatisfactory
- iii. Which assets are being transferred
- iv. Staff transfer
- v. Audit rights
- vi. Contingency planning & disaster recovery
- vii. Intellectual property rights in slow dev during the contract
- viii. Duration of the agreement & termination provisions

- 4 (a) The ministry has appointed an administrator for the project to monitor and ensure security of the system. Is the monitoring process ethical? Discuss the ethical nature of the process and its consequences.

(08 marks)

**ANSWER IN THIS BOX**

- i. The administrator is given a lot of rights are he/she is not a right come person, he many measures the power.
- ii. Email monitoring in the office environment – is unethical as it invade people's privacy
- iii. Monitoring system related activities is ok as right security need to be maintained
- iv. Password allocation is a serious responsibilities and giving access rights to people is also an important task

- (b) Briefly describe how patient data would be protected using the data protection principles.

**(08 marks)**

**ANSWER IN THIS BOX**

- i. Sensitive personal data related to ethnic, political, religion belief, social affiliation, physical health, mental health, sexual life and with respect to any criminal offence need to be strictly protected according to the law
- ii. Storing, retrieval, processing and revealing of such information need to be very carefully looked at
- iii. the purpose at obtain the data need to be related and the data should not be used for any other purpose
- iv. data transfer should not happen out side countries unless the data is encrypted and protected property

Index No: .....

- (c) Compare and contrast the existing manual healthcare system with the proposed Electronic Patient Record Management System and discuss the advantages, disadvantages and concerns.

(08 marks)

**ANSWER IN THESE COLUMNS**

<b><u>advantage</u></b>	
Manual	Proposed EMR
i. historical into different location ii. record kept in 1 hospital iii. resend difficulty with information	i. information available electronically all the time ii. historical information is available 24/7 iii. records available from any word in the world iv. essay of processing information to do research v. pro-active decision
<b><u>disadvantage</u></b>	
i. Loosing information ii. Time consume to search iii. Data protection is less iv. Not available all the time v. Can't process for research	Security of information Privacy of information Exporting information to a lot of parties (unethical motives)

\*\*\*\*\*