

## Web Development Technologies

### COSC2450 ASSIGNMENT 2 SPECIFICATIONS

**Version 2.0 update on 8/8/2013**

**Scope of change: security requirement**

#### 1) Submission Guideline

- Assignment 2 is due **Sunday Week 11, 11:59PM** and worth **35%** of the assessment. You must attempt this assignment individually.
- Each submission package must include
  - Visual Studio.NET project files and all source files
  - All SQL script necessary to recreate the database schema, tables schema, stored procedures and triggers used in the system and populate default data
- **Test your script properly before submission** - it must be executed in the lecturer's machine (when required) without any manual change. Marks will be deduced for scripts containing errors or requiring manual changes.
- A README.txt file documenting the followings
  - Your full name, your Student ID
  - Features that you have implemented including *known limitations* of those features
  - Instructions to deploy and execute the whole application.
- *While the readme.txt file won't give you any mark, missing it or any of the required information may incur a mark deduction to up to 2 marks.*
- Refer to Submission Standard document (in Black Board) for more details about assignment submission rules for this course.

#### Important Points

- You are supposed to *demo your application* during the lab of **Week 12** or **Week 13**. Each student must book demo time at one of these 2 labs. Your presence to the lab demonstration is necessary for your assignment to be marked.

## 2. System Specification

### 1) Overview

For this assignment, you will deal with the following topics: ASP.NET, ASP.NET AJAX, AJAX Control Toolkit, ADO.NET, SQL Server, stored procedures/LINQ-2-SQL, and triggers.

### 2) Non-functional Requirements (7 marks)

#### a) User-friendly UI (5 mark)

The UI must be easy to use. Therefore, spend time thinking about the design of your application (e.g. workflow, screen navigation, web layout etc.) before actually implementing it. Note that this component is only concerned with overall application's usability. Marks for individual function's usability are already incorporated in the marking guideline in Functional Requirement section.

#### b) Good OO design/code (2 marks)

Adherence to the coding standards described in this document (<http://www.idesign.net/idesign/download/IDesign%20CSharp%20Coding%20Standard.zip>), good OO design and exception handlings mechanism, use of generics collections.

### 3) Design Requirements

**These technical requirements must be strictly adhered to.** Not adhering to these requirements may make you lose many marks for the relevant components.

- a) You are recommended, but not required, to use ASP.NET Membership API, Role API and/or Profile API for the user management functionality. If you do this, you must use `aspnet_regsql` to generate the schema and merge that with your database.
- b) For database operations, you can choose between these 2 strategies: use **ADO.NET** with *stored procedures* or **LINQ-2-SQL**. You must **not** use dynamic or hardcoded SQL statements in your application.
- c) You must use UpdatePanel and UpdateProgress controls for most modification operations in the site except for the popup. For example saving, displaying etc. should be done via asynchronous postback enabled by UpdatePanel.
- d) You must use validation controls to make sure that only the valid data is entered into the system. For example email address of a user must be valid.
- e) You must use Calendar control of the AJAX Control Toolkit for any date time selection in your application.
- f) You must use ASP.NET Master Page to organize reusable site elements and common styling.

#### 4) Functional requirement: (28 marks)

This assignment requires you to build an Electronic Medical Record (EMR) system that support management patient treatment in medical facility such as clinic or hospital. Based on your assignment 1, you need to amend your data model to capture the following business requirement. Each visit to medical facility will also include prescriptions (list of drugs that a patient has to take with dose, quantity, and duration) and subclinical services.

Dr Fred Jones  
23-31 Brighton Road  
SANDGATE 4017

1231231 Phone # 07 3252 2425  
Script # 1.1013

Mrs Danielle SMITH  
412 Lakeshore Drive  
SHORNCLIFFE 4017

SEND TO PATIENT [Y]

Endoxan (Powder for injection) 2 g  
as directed  
Quantity : 1 No Repeats

Endoxan (Powder for injection) 500 mg  
as directed  
Quantity : 2 No Repeats

2 items on this script

*Fred Jones*  
Dr Fred Jones  
MBBS

Issued under clause 37 and/or 62 of the Poisons Regulation 1994 (NSW Only)

2700mg 1V on day 1 *fr*

Each visit will consist of a prescription with one or many prescription details. Each prescription detail contains information of drug, quantity (number of tablets), dose per day (how many tablets a day), and special instruction. Each prescription will have information such as ID, date, prescribed doctor.

Each visit will also contain a lab order with one or many lab order details. Each lab order detail contains information of a medical service and its result. Each lab order will have information such as ID, date, ordered doctor.

**BỘ Y TẾ**  
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**PHIẾU CHỈ ĐỊNH XÉT NGHIỆM**

Họ tên BN: \_\_\_\_\_ Tuổi: \_\_\_\_\_ Nam ☐ Nữ ☐  
Chẩn đoán: \_\_\_\_\_

**YÊU CẦU XÉT NGHIỆM:**

<b>KIỂM TRA TỔNG QUÁT</b>	<b>KIỂM TRA VIÊM GAN SIÊU VI A</b>	<b>KIỂM TRA CHỨC NĂNG TUYẾN GIÁP</b>
<input type="checkbox"/> Huyết đồ 60.000 đ	<input type="checkbox"/> Ac HAV 110.000 đ	<input type="checkbox"/> T3 70.000 đ
<input type="checkbox"/> VS 20.000 đ	<input type="checkbox"/> IgM HAV 110.000 đ	<input type="checkbox"/> T4 70.000 đ
<input type="checkbox"/> Đường huyết 25.000 đ	<b>KIỂM TRA VIÊM GAN SIÊU VI B</b>	<input type="checkbox"/> FT3 70.000 đ
<input type="checkbox"/> Cholesterol TP 25.000 đ	<input type="checkbox"/> HBsAg 80.000 đ	<input type="checkbox"/> FT4 70.000 đ
<input type="checkbox"/> Cholesterol HDL 25.000 đ	<input type="checkbox"/> Anti HBs 90.000 đ	<input type="checkbox"/> TSH 70.000 đ
<input type="checkbox"/> Cholesterol LDL 30.000 đ	<input type="checkbox"/> Anti HBc 110.000 đ	<b>H.T CHẨN ĐOÁN KÝ SINH TRUNG</b>
<input type="checkbox"/> Triglyceride 30.000 đ	<b>THEO DÕI VIÊM GAN SIÊU VI B</b>	<input type="checkbox"/> Fasciola hepatica 70.000 đ
<input type="checkbox"/> Urée 25.000 đ	<input type="checkbox"/> HBcAg 80.000 đ	<input type="checkbox"/> Gnathostoma 70.000 đ
<input type="checkbox"/> Creatinine 25.000 đ	<input type="checkbox"/> Anti HBc 80.000 đ	<input type="checkbox"/> E. histolytica 70.000 đ
<input type="checkbox"/> A. Urin 25.000 đ	<input type="checkbox"/> DNA-HBV (Đ. Tinh) 460.000 đ	<input checked="" type="checkbox"/> Strongyloides 70.000 đ
<input type="checkbox"/> SGOT, SGPT 40.000 đ	<input type="checkbox"/> DNA-HBV (Đ. Lưng) 460.000 đ	<input type="checkbox"/> Taenia solium 70.000 đ
<input type="checkbox"/> TPT nước tiểu 50.000 đ	<b>KIỂM TRA VIÊM GAN SIÊU VI C</b>	<input checked="" type="checkbox"/> Toxocara canis 70.000 đ
<b>380.000 đ</b>	<input type="checkbox"/> Anti HCV 110.000 đ	<input checked="" type="checkbox"/> Echinococcus 70.000 đ
<b>KIỂM TRA BỆNH TIỂU ĐƯỜNG</b>	<input type="checkbox"/> RNA-HCV (Đ. Tinh) 520.000 đ	<input type="checkbox"/> Paragonimus 70.000 đ
<input type="checkbox"/> HbA1c 100.000 đ	<input type="checkbox"/> RNA-HCV (Đ. Lưng) 520.000 đ	<input type="checkbox"/> Schistosoma 70.000 đ
<input type="checkbox"/> Đường huyết 25.000 đ	<input type="checkbox"/> Định typ HCV 800.000 đ	<input type="checkbox"/> Trichinella 70.000 đ
<input type="checkbox"/> Đường niệu 15.000 đ	<b>TAM SOÁT DẤU ẮN UNG THƯ</b>	<input type="checkbox"/> Ascaris lumbricoide 70.000 đ
<b>KIỂM TRA ĐIỆN GIẢI ĐÓ</b>	<input type="checkbox"/> α FP 90.000 đ	<input type="checkbox"/> Angiostrongylus 70.000 đ
<input type="checkbox"/> Ion Na <sup>+</sup> , K <sup>+</sup> , Cl <sup>-</sup> 65.000 đ	<input type="checkbox"/> CEA 130.000 đ	<input type="checkbox"/> Toxoplasma gondii 220.000 đ
<input type="checkbox"/> Ion Ca <sup>2+</sup> /máu 25.000 đ	<input type="checkbox"/> PSA 110.000 đ	<b>KIỂM TRA NHIỄM SIÊU VI</b>
<b>KIỂM TRA THÁP KHỚP</b>	<input type="checkbox"/> CA 12.5 130.000 đ	<input type="checkbox"/> Rubella 220.000 đ
<input type="checkbox"/> CRP 60.000 đ	<input type="checkbox"/> CA 15.3 130.000 đ	<input type="checkbox"/> Dengue 50.000 đ
<input type="checkbox"/> ASO 50.000 đ	<input type="checkbox"/> CA 19.9 130.000 đ	<input type="checkbox"/> CMV 200.000 đ
<input type="checkbox"/> RF 50.000 đ	<input type="checkbox"/> CA 72.4 130.000 đ	<input type="checkbox"/> EBV 140.000 đ
<b>KIỂM TRA CHỨC NĂNG GAN</b>	<input type="checkbox"/> CYFRA 21.1 120.000 đ	<b>KIỂM TRA THEO DÕI NHIỄM HIV</b>
<input type="checkbox"/> SGOT, SGPT 40.000 đ	<input type="checkbox"/> SCC 150.000 đ	<input type="checkbox"/> HIV Western Blot 880.000 đ
<input type="checkbox"/> GGT 35.000 đ	<b>KIỂM TRA BỆNH XÃ HỘI</b>	<input type="checkbox"/> CD4/CD8 250.000 đ
<input type="checkbox"/> Bilirubin TT, GT 35.000 đ	<input type="checkbox"/> HBsAg 80.000 đ	<input type="checkbox"/> HIV-DNA (Đ. Tinh) 400.000 đ
<input type="checkbox"/> Điện di Protein 100.000 đ	<input type="checkbox"/> Giang mai 80.000 đ	<input type="checkbox"/> Định lượng HIV 580.000 đ
<input type="checkbox"/> α FP 90.000 đ	<input checked="" type="checkbox"/> HIV 90.000 đ	<input type="checkbox"/> HIV - Kháng thuốc 1.400.000 đ
<b>Xét nghiệm khác:</b>	<input type="checkbox"/> Siêu âm màu 100.000 đ	
<input type="checkbox"/> Điện di HB 250.000 đ	<input type="checkbox"/> Siêu âm trắng đen 40.000 đ	
<input type="checkbox"/> Điện di Protein 100.000 đ	<input type="checkbox"/> Điện tim (ECG) 20.000 đ	

Ngày \_\_\_\_\_ tháng \_\_\_\_\_ năm 201\_\_\_\_  
Bác sĩ điều trị \_\_\_\_\_

Ghi chú: Đối với các xét nghiệm có sẵn (ở mặt sau) quý Bác sĩ có thể gạch chéo vào ở phần thứ hoặc ghi thẳng vào dòng "Xét nghiệm khác".

Họ tên: \_\_\_\_\_  
(Tra kết quả xét nghiệm từ 15 giờ đến 17 giờ hàng ngày)

for:N/A

Date:1

## Hematology ABG Analysis

Specimen: Arterial blood

Date and time specimen gathered: 07/21/2010 21:42pm

Blood Gases:

Acid/ Base:	Results:	Reference Range:	Flag:
pH	7.27	7.35-7.45	(L)
pCO2	48mmHg	35-45 mmHg	(H)
pO2	92mmHg	80-100 mmHg	
HCO3	25 mEq/L	24-26 mEq/L	
O2 sat	97%	95-100%	

In the assignment 1 you have developed the following entities: doctor, hospital, patient, and visit. Therefore, in this assignment you need to build additional entity classes for Prescription, PrescriptionDetail, LabOrder, LabOrderDetail, Drug,

DrugGroup, MedicalService, MedicalServiceGroup. ICD, ICDChapter

Information of a drug includes drug name, generic name, unit (tube, tablet, bottom...), and price. Information of a medical service includes service name and price.

In this assignment, you are also required to change ICD value in visit as a string to coded value meaning that you must build an ICD class to serve as a lookup list for visit. Each ICD will have ICD chapter, ICD name, and ICD code.

- a. Amend the data model to cope with the business requirement discussed above, i.e. classes for the following entity  
Prescription, PrescriptionDetail, LabOrder, LabOrderDetail, Drug, DrugGroup, MedicalService, MedicalServiceGroup. ICD, ICDChapter
- b. Build the GUI (Webforms) to maintain lists of all entities in the data model in including Patient, Doctor, Hospital, Visist, Prescription, PrescriptionDetail, LabOrder, LabOrderDetail, Drug, DrugGroup, MedicalService, MedicalServiceGroup. ICD, ICDChapter.

For each entity, you have to implement 6 operations: **add new, update, delete, view all, view one item, and search**. Note that as discussed in the design requirement section, there must be service (or data store) layer that perform CRUD operations on these entities, implemented either by LINQ to SQL or Stored Procedures.

- c. As the list of hospitals and doctors will be constantly changed, you must simulate an online data source which contains all updated doctors and hospitals. This will be implemented by using web services. For example, <http://your/url/HospitalList> will return a json or xml string that contains all latest hospitals, and similar for <http://your/url/DoctorList>. Your system will talk to these webservices in every 5 minutes to check for change and update your local list accordingly.
- d. Use crystal report to build the following report:  
Report 1

<b>Patient Visit List</b>					
From Date	1/02/2013				
To Date	28/02/2013				
Hospital	ABC				
No	Patient Name	Age	ICD	Prescription	Lab Test
1	Patient 1	26		Amoxilin (12, 3); Paracetamol (6, 2)	Blood 6 params, ChestX Ray, Stomach Ultrasound

## Report 2

<b>MORBIDITY AND MORTALITY REPORT</b>								
<i>From Date: ..... To Date: .....</i>								
No	Disease	MÃ ICD-10	Morbidity			Mortality		
			Total	Male	Children <15y	Total	Male	Children <15y
VN			1	2	3	5	6	7
	<b>Chương I : Bệnh nhiễm khuẩn và kí sinh trùng</b>							
001	Tả	A00						
002	Thương hàn, phó thương hàn	A01						
003	Lị trực khuẩn do Shigella	A03						
004	Lị Amip	A06						
005	Ỉa chảy, viêm dạ dày, ruột non có nguồn gốc nhiễm khuẩn	A09						
006	Bệnh nhiễm khuẩn đường ruột (A04-A05, A07-A08)	A02, A15-16						
007	Lao hô hấp	A15-16						
008	Các dạng lao khác	A17-19						
009	Dịch hạch	A20						
010	Bệnh do Brucella	A23						
011	Phong	A30						
012	Uốn ván sơ sinh	A33						

c. This is an amendment to the Assignment 2-2013B (update 8/8/2012)

You have to implement security for the system using either the use ASP.NET Membership API, Role API and/or Profile API or your own API. Authorization to the system will be in 2 levels: admin user role and normal user role. Admin user can do all accesses to the system whereas normal user can NOT make changes (add, update) on the lists of ICD, Hospital, Doctor, Drug, DrugGroup, MedicalService, MedicalServiceGroup.

