Comp2147 Group Project: ABC clinic

Group Size: Maximum Six Students   **Due Date: Dec 5, 2021**

Your company has been awarded the contract to create a **"Clinical Management System"** software using Object Oriented /Unified Process methodology for the **ABC family medicine and walk in clinic.** Some members of your team interviewed the client; the clinic manager, to collect requirements about the proposed system and took the following interview notes.

Case Description by clinic manager

I am building a new family medicine and walk-in clinic (ABC clinic) in the Greater Toronto Area. We are anticipating to serve to approximately 1500-2000 patients per week on the average. We will initially have ten physicians (doctors), six nurses and eight receptionists and two Assistant managers to help me in running the day to day affairs of the clinic. Our clinic will be open 9a. to 7p.m Monday to Saturday.

I have almost twenty (20) years' experience of managing medical clinics. We would like to store patient related data electronically as there is a governmental regulation to store and safeguard patients' information for confidentiality and privacy reasons. I have seen some very sophisticated software systems implemented in some clinics which offer almost all electronic features and are practically paperless and would like to have something like that for our clinic. Our Budget is 1 million dollars and the system should be implemented (completed) within 9 months timeframe.

Based on our discussion today I am summarizing the main functions that we would like to have in the software. I might forget to mention some items here and in case you need further information/clarification please don't hesitate to contact me at any time (as a group or in the class/lab). I might also send you any additional information at a later stage.

Our business motto is to deliver best possible healthcare to our patients and we hope that the system that your team will develop will help us achieve excellence. I would be delighted to answer any further questions from your side and please let me know in case you would like to interview other potential user (doctors, nurses, and receptionists) and I will arrange it as well.

New Patients will have to call the clinic to book an appointment with a physician and if they decide may become permanent patients of one of our physicians by filling up Ministry of Health's forms. We are required to send these paper forms to the ministry (and keep one copy for our records). Once they become permanent patients, they can either book, cancel or reschedule an appointment either online or by calling the front desk. Once booked an appointment can only be cancelled or rescheduled until 24 hours before the scheduled time. No shows or missed appointments are charged 30$ Patients do not have to pay for medical services in Canada however they are certain items that are not covered by the government and the patients will be required to pay for these services such as medical/sick notes, travel vaccinations etc. We will accept payments in cash or via a major credit card.

Patients may also come as a walk-in patient during the business hours and are put in the queue for the first available physician at that time (They cannot book a walk-in appointment). The system should keep a track of patients' appointment and change the status accordingly: booked, cancelled, arrived, Checked IN, Checked OUT, LWT(left without treatment), No show etc.

Walk in patients are checked in, placed in the queue and are seen by the next available doctor. There are two exceptions to this process; a patient may request to be seen by a particular doctor and a patient may jump the wait line in case of an urgent need i.e. the triage process (i.e. chest pain, wound treatment etc.). The default time slot for patient appointment with doctor is 15 minutes but patients with special circumstances can be scheduled for double time (30 minutes).

The system should store patients' basic information including her name, address, contact, health card, and his or her previous history of visits, treatment, medications, and lab results. Upon arrival (both scheduled and walk in) the receptionist would verify each patient's health card in real time (linked directly with ministry's system), address and contact details and then the secretary marks "checked in" status. At the end of the appointment, the secretary marks a "check out" status.

The nurse will then take the patient to an examination room and enter his or her temperature, height, weight blood pressure and brief history of

problems/symptoms and notes it down in the system. The patient is then seen by a doctor who would enter patient's complaints/symptoms, diagnosis and medications prescribed.

The doctor should be able to do the following three tasks either by generating a print out from the system (and hand it to the patient) or send directly to the external party electronically (if the third party offers an electronic interface).

   a. Prescriptions (print out given to the patient or sent to the pharmacy electronically)

   b. Lab Requisitions (print out given to the patient or sent to the Laboratory electronically: and receiving the test results back electronically as well).

   c. Specialist Referrals (print out given to the patient or sent to Specialists doctors' offices electronically: and receiving the specialists notes/letters back electronically as well)

The system should be able to store scanned copies of paper documents in some situations (for instance: in case of receiving paper based lab results/specialist letters.

In case of any abnormal lab test results, patient should be recalled back to the clinic immediately to be seen by a doctor and discuss the results. The system should keep a track of all the calls made or messages sent to the patient by the clinic.

The physicians are paid directly by the government for the services rendered to the patients. The system should provide the capability for the doctors to bill the government for their services and see their payments.

There are however some patients who do not have government health coverage and they may pay cash, or may have coverage by an insurance company and the system should provide the Accounts Receivable and payable functionality for these and other cash payments (non-covered services mentioned before).

The system should also provide reports about patients, visits, financial accounts, usage statistics etc.

My job responsibilities as a manager include scheduling doctors, nurses and receptionists/secretaries for shifts. I calculate the number of hours worked for each non salaried employees (except doctors off course). I then provide this information to our accountant (external company hired by the owner) and they take care of payrolls and salaries. Full time employee's salaries and payroll is also managed by our accounting firm.

Project Deliverables

1. Create a **system service request** for creating a Clinical Management System for ABC clinic as requested by its Manager John Doe (use template from chapter 3-slide 8)

2. Develop a professional scale **project charter (1-2 pages)** as stipulated by PMBOK®. Please research find some suitable template for project charter.

3. Develop a **Feasibility Analysis** document (4-5 page long) to justify the project from financial, organizational, and technical view point (use various templates from chapter 4).

4. Perform **textual analysis** of the business processes of ABC clinic as described above in this document in order to identify the candidate actors and use cases and create a **use case diagram (**first cut).

5. Pick any **TEN (10)** use cases from your project and create **Written Use Cases** at the Kite Level (bird-eye view, use the template in chapter7 of the text book (fig 7-32, 7-34 on page 226/228).

6. Create Three (3) **Activity Diagrams** for **any three** business processes belonging to your project, use the template in chapter7 of the text book (fig 7-37, 7-38, and 7-39 on page 233/234).

7. Modify the first cut use case diagram created in the above step based on the additional details derived from the written use cases activity diagrams and create a refined and detailed use case diagram by incorporating **<<include>>, <<extend>>**, and <<**generalizations>>** relationships.

8. Create a **context level data flow diagram (DFD)** to capture the scope of your project, use the example in chapter7 of the text book (fig 7-4 on page 187)

9. Decompose the context level data flow diagram to create the **Level-0 DFD** (text book names it as *Level-0* but the Visual Paradigm tutorials name it as *Level-1*).

10. Create a decision table to capture the process logic for your system (use the reduced version on page 204, fig 7-19). The table should contain **at least** 2 conditions and 4 courses of action.

11. Pick any one Business Process and create a BPMN diagram.

12. Create a **conceptual Data Model** (ER) model (incorporate entity generalization hierarchies, if any, and business rules for overlap and disjoint)

13. Create an ER Model for fully normalized relations **(Logical Data Model)**, use example 9-16 on page 331.

14. Create a **class diagram** that would display class names, attributes, associations and relationships (generalization, composition, and aggregation)

15. Create wireframes for at least **Five (5)** important forms (and/or reports) for your project, use example in fig 10-3A (power point for Chapter 10 slide no 11)

16. Create a Dialogue diagram for any one actor/scenario, use example (Power Point chapter 11 slide no 49)

17. Create a testing strategy for your system which should include the test types and testing process you would specify [One page document] (use information provided in chapter 13, page 457-464)

PROJECT SUBMISSION DETAILS

Submission should be ONLINE through **Blackboard Project Submission** Link in the form of a SINGLE **MS Word® report/document** (just one file per group) and add all models or other components in this report. Submission Deadline is Sunday December 6, 2020 (midnight).

LATE SUBMISSIONS WILL BE SUBJECT TO 10% PER DAY PENALTY.

LATE SUBMISSIONS SHOULD BE EMAILED TO THE INSTRUCTOR (as the BB Submission Link will become inactive after the deadline)

Please export all models created in Visual Paradigm/MS Project and add/copy in this report.

DO NOT SUBMIT FILES IN ANY OTHER FORMAT SUCH AS VISUAL PARADIGM®
Your report should include a cover page (containing names and student Ids of all group members in alphabetic order) and a **table of contents which** SHOULD follow the numbering system for individual sections as provided in this document. (For example **Activity Diagrams** is Item No 8 and **Class Diagram** is item number 16)

Project reports that do not follow the above mentioned formatting requirements would be subject to a 10% Penalty.