Continuous Assessment Brief

Enterprise .NET II – May 2015

Course Registration System

ABC is a training vendor to provide IT-related training to IT professionals in Singapore. All of the courses offered by ABC are short courses that runs for less than 6 days (so far). Each course may be offered multiple times in a year depending on its popularity. The maximum size of each course will depends on the subject and the capacity of the classroom.

To manage ABC's registration process, ABC Course Registration System is proposed. The application should be implemented using Microsoft .NET version 4.5. The CIO is keen to adopt good software engineering practices and at the same time take advantage of the numerous powerful and productive features offered by the .NET platform. The software solution should be designed based on a Layered Architecture to provide effective separation of concerns. In addition, the system should carefully consider relevant enterprise design patterns and use them where appropriate.

ABC plans to have multiple releases of the software. This document describes the functionality envisioned to be in their first release.

Note: *Given the similarity of ABC's business with professional courses offered by ISS, you can refer to ISS website to get more realistic view on information required for courses and registration for your system.*

In addition to the features explained in the previous brief, ABC would like to exposes portions of the application functionality to some of their partners so that their partners can integrate with the new course registration system better.

WCF Related Functional Specification

1. Course Registration Web Service
   ABC would like to position itself as the preferred training provider for enterprise customer. One of the strategy is to allow integration with the HR system of the enterprise customer. ABC would like to expose a web service using WCF to allow external system to register for a course without using the web interface. One of ABC's concern is about security. As part of this assignment, propose a way to handle the security to prevent unauthorized registration.

2. Attendance system
   ABC is considering an automated attendance system to replace manual attendance signing by the participants. At the moment, there are multiple approaches that are being considered including the use of smartcard, iBeacon device, smartphone apps, and so on. However, ABC would like to expose a standard API that allow any third part system in the local network to send an attendance taking input. There are 2 services that need to be implemented

1. Get Student List
   Input: Date and Course Code
   Output: List of participants

2. Submit attendance
   Input: Participant ID, Course Code
   Output: Status (success/fail)

3. Another functionality of your choice to be exposed. You will need to explain the value of exposing this functionality and the use case that may make use of this web service.

Expected deliverables for:
- Fully implemented, functional web service for course registration developed with WCF
- Demonstration of the web service using a client application
- Justification and explanation on the design decision for this web service (transport, protocol, security, etc)
- Explanation on how security is handled for this web service

Workflow Functional Specification

These two processes are related to the fee subsidy given by the government for Singapore Citizen and Singapore PR. The condition of the subsidy is that they need to have >=80% attendance and pass the assessment given by the instructor.

These are the two flows that need to be implemented:

1. Course Confirmation Process
   One week before the start of each course, there is a process to check whether a course will be run or not, and if it is going to run, participants is going to be asked for payment otherwise they will be notified about the cancellation.

   Implement a workflow to implement this process
   1. The workflow will be triggered manually from web page on the application (perhaps the class management page)
   2. If the number of registration is less than 5, then cancel the class, if the number of participants is more than 10, the class is confirmed. If the number of registration is between 5 to 10, the system should ask the course administrator to make a decision whether to cancel or to confirm the class.
   3. If the class is canceled, then database is updated, and email is sent to all of the participants. Note: for demonstration, there's no need to really send email as long you can show that instruction to send email to different email address is really has been called. You can replace the actual action of sending email to some other action like logging into a file, or post a tweet or something.
   4. If the class is confirmed, update the database, calculate the fee and send email to the participant with the fee payable.
   5. The fee is calculated as follows: if the participant is a Singapore Citizen or Singapore PR, then they only need to pay 30% of the course fee due to government subsidy, otherwise they have to pay the full fee.

6. (Optional for extra mark) Only terminate the flow if all the payment has been received. The workflow does not need to track the real payment, but we can assume that the admin can trigger the workflow each time a payment is made.

2. Course Completion Process

   When the class is completed, there is a process to check whether the requirements of the subsidy have been fulfilled.

   1. The process is triggered manually from the website
   2. Check for participants who are Singaporean or Singapore PR. These would be the participants who only paid subsidized fee
   3. Check whether their attendance is >=80%. If their attendance is below 80% then they have to repay the subsidy
   4. Send the list of subsidized participants with good attendance to the instructor for assessment
   5. The instructor will then returned the list of participants who has passed the assessment.
   6. Create list of participants who has fulfilled their obligation, and another list of participants who fail to fulfill their obligation and send it to the course admin (or record it somewhere in the system)