

## **CS5002 Software Engineering**

### Assignment - (Individual)

You are a Software Engineer from a software development company. Your firm has been contracted by “**Sound Strong**” to provide a computerized information system to maintain record of customer and their payment details.

It has been decided that you will use Unified Software Development Process (USDP)/Rational Unified Process (RUP) with the Unified Modelling Language (UML) to carry out the work.

### **1. Specification**

“Sound Strong” is a music institute providing musical instruments training and recording service for a decade. Apart from that it also provides **practice room rental service** for musicians. Its practice rooms hiring service has been in demand lately with the quality of rooms and instruments they provide. To manage the heavy influx of customers and the difficulty with phone call-based booking, it is looking for an online system for practice rooms/instruments hiring related processes.

Basically, musicians can book the room for certain timings and practice in the allocated time. The room can be hired on an hourly basis and if a customer is new, he/she has to pay a certain advance up to 8<sup>th</sup> booking if they haven’t taken membership. The customers have to be registered in order to use the system. The staff handles the registration verification process and verifies registration.

There is a discount scheme and special package for customers who have membership. After the membership duration expires, customers will get an automatic message before a week of expiry and customers can choose to renew the membership or stay as a customer.

Apart from the rooms hiring, it also gives chance to hire the musical instruments in case the customers need guitar, drums parts, bass guitar, guitar effects and so on for the practice hours. The customers look for available room timings in the institution's online system and get their bookings done and also book the

instruments based upon the availability if they need it. Staff updates the system almost regularly to typically address the alteration owing to the factors like booking cancellation and many others.

### **1.1 Detailed Specification**

The proposed system is to have following functions

1. Register customer – registering the customer to use the system with necessary details.
2. Register staff – registering the staff in the system.
3. De-register member/customer – deregistering membership to just customers or deregistering customers from the system.
4. De-register staff- deregistering the staff that are no longer a staff.
5. Book the practice room- book an appropriate room and timing.
6. Book preferred instruments- in case needed, reserve an instrument.
7. Maintain user/payment detail- keep a record of all the details of users and payments.
8. Generate report- report generation facility for organization's purpose by staff.
9. Notify customers- customers are notified automatically by the system half an hour before their reserved time and members are notified a week before their membership expires.
10. Manage bookings—Staff can cancel the booking if need arises, and re-allocate the timings after agreement with the relevant users.

### ***Planning, requirements modelling and analysis (75%)***

1. Produce a Gantt chart indicating how you might schedule the work of developing the system. Your schedule should clearly be related to delivering the requirements of “Sound Strong” and should reflect RUP/USDP practice.
2. Produce a Use Case Model for the required system – including a Use Case diagram, and High Level Use Case Descriptions for each Use Case. For two of the Use Cases, produce Expanded Use Case Descriptions.

Choose one of these expanded Use Case Descriptions to model both the Collaboration and Sequence diagram, in 3, below.

3. Explain in words how you would go about producing the Communication diagrams, that is a Collaboration diagram and a Sequence diagram, from the Use Case model.

Produce a Collaboration diagram and then produce a Sequence diagram for the same Use Case.

4. Explain in words how you would produce the Class Diagram.

Produce an Analysis Class diagram showing the domain classes.

### ***Design (25%)***

5. Explain how you would move forward from this part of the development process. What techniques/products might be produced for the design? Explain briefly the purpose of each.
6. Develop prototype for “Sound Strong” application including features which are listed in detailed specification.