

Fundamentals: Software Engineering
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Group coursework worth 20% of your final mark
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Submission is due by May, 1 2014- 2:00 pm - Firm Deadline
Early submission is strongly encouraged to ease face-to-face design
walkthrough feedback

Consider an **Online Travel & Hotel Booking System (Travpedia)**. Airlines companies and hotels can subscribe to Travpedia to advertise for their products (flights, hotel rooms, promotional deals etc). They pay Travpedia £50 for joining the service and a monthly payment of £200 pounds. Online users can sign up to Travpedia to browse offerings, searching for products, rank and review products, rank service, share and discuss reviews on flights and hotels, book for a product, pay, etc. Travpedia can also provide recommendations to the buyers based on reviews, budget, preference information, patterns of use etc. Subscriptions and payments are handled online by a third party consortium. Payments are accepted using credit/debit cards or through vouchers. Travpedia uses the buyers' profiles to disseminate advertisements and promotional offers to mobile phones, screens, and e-mails. One critical requirement of Travpedia is managing compliance and security requirements of users and their profiles (e.g. personal data, credit card details, preference and lifestyle information and the like from sensitive data). If such data is maliciously accessed, disclosed, leaked, or manipulated, it could breach confidentiality and data protection. Another critical requirement of the service is that it shall be scalable to accommodate the growing number of online users, airline companies and hotels and shall be available 24/7. The system can handle up to 1 million online users during peak time. All transaction information passed by the system to the credit/debit card consortium is secure and encrypted using 128-bit SSL certificates. Users' profiles, itineraries and transactions are stored and backed up to three distinct database servers (two in UK and another in USA) for safety.

- Detail the above brief specification describing the system, stating your own assumptions on the scope of the system. Be precise, concise, and creative! Assume that your specification reflects on the requirements and views of the involved stakeholders. Note - your scope should be reasonable enough to be handled by five members. **(1 point)**
- State the functional and non-functional requirements of your system. Use sensible phrasing, grouping and prioritising using MoSCoW. **(2 points)**
- Use UML to document the analysis and design of your system to a professional level.

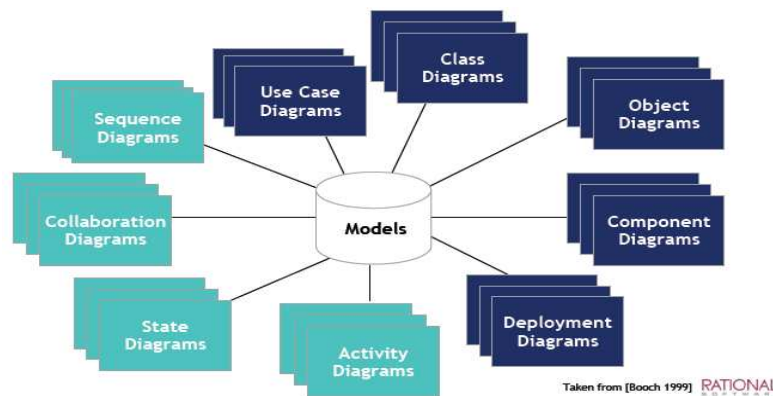


Figure 1. UML Diagrams

- Provide a comprehensive Use Case diagram for your system clearly indicating the actors involved. Make sure you use stereotypes such as <<extend>> and <<include>>. **(2 points)**
- Choose three non-trivial use cases of your Use Case Diagram. Document the corresponding actors. Provide meaningful documentation for each of the Use Cases using pre/post conditions, flow of events and scenarios. **(2 points)**
- Provide an Activity Diagram for a non-trivial scenario of interest. Make sure you use forks, swim lanes, and conditions. **(2 points)**
- Perform Class Analysis: **(2 points)**
 - Perform noun-verb analysis over your specification: Identify the potential classes and potential operations for these classes using what discussed in Lectures. Derive your CRC (i.e., Class, Responsibility, and collaborators)
 - Produce a First-Cut Class diagram to combine the consolidated results of using the above two techniques – i.e., noun-verb analysis and responsibility-driven analysis.
 - Detail your Class Diagram. This should provide details on attributes, operations, relationships, visibility, multiplicity, etc) (refer to the class notes).
- Provide an Object Diagram. **(1 point)**

- Provide a Sequence Diagram for a non-trivial scenario of interest. Make sure you use guards, envelopes, etc. State any assumption you make. **(1 point)**
 - Provide a State Diagram for a non-trivial scenario of interest. Make sure you use guards, envelopes, etc. State any assumption you make. **(1 point)**
 - Travpedia needs to adopt a sensible architecture. Your group should work on identifying architecture decisions to meet possible tradeoffs for scalability, availability, safety etc. Your group is encouraged to think of other tradeoffs. Provide Component Diagram and Deployment Diagrams for the two candidate architectures. Your modeling should clearly show how the candidate architectures meet these critical non-functional requirements **(3 points)**
- **Consistency and Maturity.** Follow a systematic design for all the above questions. Be consistent in using the naming across all your diagrams and their supporting documentations. Strive for a professional analysis and presentation. Make your own judgment for what to be modeled, documented, and presented. **(3 points)**

Submission requirements

- The report should be typed and presented in A4 paper format. The covering page should include your group number, ID numbers, and e-mails of all members in your group.
- Your diagrams should be produced using open source UML packages or Visio (installed in all labs).
- Please, do work effectively towards meeting the requirements of this coursework. Brief Snapshots of this exercise may appear again in your examination.
- Please submit by **May 1, 2014- 2:00 pm** both a hard- and soft - copies of your documentation. E-mail your softcopy to **bham.fse@gmail.com with your group in the subject head**
- **Please DO NOT use e-mail**, as this will make it difficult to trace all submissions. Deposit your hardcopy in the designated Fund: Software Engineering safe (by the reception).
- Demonstrators of this module will provide courtesy feedback/consultations per group.

Good Luck!