Software Engineering (ISW)
Exam. Act 1
04-11-2013
ETSInf-UPV

NAME:

Time: 2 hours

Questions *(3 points)*

1. **(***0.5 points)* What types of quality factors are there and how may they be measured?

2. *(0.5 points)* Enumerate two process models that are iterative and evolutive. Justify why they are so.

3. *(1 point)* Explain at least two advantages and two disadvantages of a closed multi-layered architecture.

4. *(1 point)* Indicate whether the following sentences are true or false. Justify your answer in both cases.

a) In UML, all the actors that are modeled in a use cases diagram must also appear in a class diagram and vice versa.

b) In a "classic with prototyping" process model a prototype may be generated at any phase of the process.

c) UML allows us to specify the structure and the behavior of a system.

d) A methodology clearly defines what (activities), who (roles), how (artifacts) and when (process or workflow).

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Problem 1. *(7 points)* The Gotham local government wants to facilitate the access to the city public services for its citizens and visitors. To achieve this goal it has requested to ISW Soft the development of a mobile application, MyTown. Using this application, the users will have access to the following services:

- Tourism information: each emblematic building will be catalogued by means of a number of properties such as its name, address, architectural style, construction date and a historical summary. Additionally, a description of the building will be accessed from the mobile phone. This description may include several images. As an additional feature, the system will offer touristic routes to those users that request them. Each route will go through different emblematic buildings and it will have an estimated duration and a length in kilometers. Finally, users will be able to search buildings by name (e.g. "miguelete") or by theme (e.g. palaces, churches, etc.)

- Lodging and restaurant information. The establishments belonging to both categories will be listed by geographical location, so that the closest ones to the user will be listed first. The displayed information will be their name, address and category. Additionally, in case of restaurants, the menu (if it is available) will also be displayed. The menu may include several offerings (set meals) with their price and the courses (also with their price) included in each offering/set meal. If a user wants to reserve a table the mobile device will call to the restaurant. However, if the mobile device is not capable of making phone calls the restaurant telephone number will be shown instead and no phone call will be made. In the case of hotels, the system will show the number of rooms and the services the hotel offers. If users want to reserve a room the system will forward them to the hotel reservations system. Additionally, the user has a search mechanism for hotels/restaurants by name, by location (e.g. downtown, periphery, etc.) or by street name.

- Public transportation information (buses and metro). The system will show all the nearby stops to the user based on the user location. For each stop the system will either show the list of bus lines with the route of each line or the metro lines. An automatic calculation of routes is left for future versions of the software.

From the previous description:

a) *(3'5 points)* Build the UML use cases model. Include the context and structured diagrams.

b) *(3'5 points)* Obtain the UML class diagram including the necessary attributes and the names for all the included relationships.