**SER 415 Assignment: Requirements Quality Attributes**

**Instructions:**

This exercise asks you to review a list of requirements and indicate whether any of them are individually deficient with respect to the IEEE-830 section 4.3 quality attributes *unambiguous, verifiable,* and *correct* (including Weigers’ notions of *feasible* and *necessary* under *correct*). Second, you need to evaluate each set and indicate if they are deficient, as a whole, with respect to the IEEE-830 quality attributes *complete, consistent,* and *traceable.*

**Set 1:** Image-guided Surgery domain

1. Each class must be designed to have the minimum variables and functions needed to accomplish its purpose. Additional objects should be implemented in a derived class in order for more specific functionality.

By indicating that there must be a limited number of variables and functions in the system and that inheritance is to be used demonstrates design requirements in the SRS, which is inappropriate.

1. The system shall have the ability to read CT and MR scans in DICOM format.

The requirement doesn’t indicate what the response is to reading CT and MR scans in DICOM format. Therefore, the SRS violates the completeness standard.

1. The system shall support interface functionality to electromagnetic tracking hardware.

This SRS fails to define “interface functionality”. Therefore, this requirement cannot be verified due to its ambiguity.

1. The system shall support software functions to graphically display CT images.

The SRS does not describe what sort of graphics are to be used in displaying CT images, making this SRS ambiguous and difficult to verify.

1. The system shall support a four quadrant display for axial, sagital, coronal, and three dimensional views.

This SRS does well in describing what it accomplishes and how it will do so. There are no blatant violations in this SRS.

1. The system shall support an ergonomic mechanism for selecting slices, zooming and panning.

This SRS fails to define “ergonomic mechanism”, making this requirement ambiguous and unverifiable.

1. The system shall allow the user to segment/detect surgical instruments from intra-operative images.

This SRS might be better written as two separate requirements. However, there are no other blatant issues.

1. The system shall provide image registration functionalities in order to overlay pre-operative and intra-operative images.

This requirement fails to define “image registration functionalities”. This makes the SRS incomplete, ambiguous, and unverifiable.

1. Components shall be limited to 8 exposed methods.

This is not an SRS, but a design constraint, which is inappropriate in this context.

1. The demo platform shall include a minimum of two application examples.

This is not an SRS, but a process constraint, which is inappropriate in this context.

1. Components that manage events shall include threading capability.

This is not an SRS, but a design constraint, which is inappropriate in this context. Additionally, this is difficult to verify with observation.

1. A test case shall be included for each component that provides 100% coverage.

This is not an SRS, but a process constraint, which is inappropriate in this context.

Quality Attributes on set 1 as a whole:

Generally speaking, the requirements above are consistent with each other. Based on the ambiguity present in several requirements, it is safe to say that several requirements were incomplete. However, these SRS’s lack backward traceability since other documents describing system features are not provided. Based on the numbering of the SRS’s, though, there is a level of forward traceability.

**Set 2: Travel Reservation System**

REQ-E1: The search facility should allow the user to find a reservation based on Last Name, Date, etc.

This requirement appears to lack descriptions on how a user can find a reservation since it alludes to more besides Last Name and Date. Therefore, this requirement is incomplete.

REQ-C1: Car rental prices shall show all applicable taxes (including a 6% sales tax)

Redundancy on taxes makes this requirement difficult to modify. The requirement also implies the display of other applicable taxes not described, making this requirement incomplete and difficult to verify.

REQ-A1: The system shall be implemented using ASP.

This is not a software requirement, but a design requirement, which is inappropriate in this context.

REQ-P1: The destination country does not have to be shown on the confirmation page for domestic flights.

The SRS is described in the negative. It is not possible to verify that something cannot happen. The SRS is also ambiguous.

REQ-S1: Dates will be displayed in the entire system in mm/dd/yyyy format.

There are no blatant violations with this SRS.

REQ-A2: The system shall not accept passwords longer than 15 characters.

This requirement fails to indicate restrictions on characters, which could be difficult when dealing with invalid characters. Therefore, this requirement is incorrect.

REQ-A3: Sometimes the user will enter the Airport Code but sometimes the closest city may replace it, so the user does not need to know what the airport code is, the system will understand it.

This is a wordy SRS, making this difficult to modify. Additionally, the requirement is ambiguous in that things will “sometimes” happen.

REQ-R1: The system shall have a natural language interface that understands commands written in English.

The English language, with all of its semantics, is very difficult for machines to interpret. This requirement is incomplete in that it fails to describe how interface will derive meaning from English commands.

REQ-S2: A reservation confirmation will be sent by email that includes the name in last name, first order,

plus the transaction id, plus the confirmed date in dd/mm/yy format.

The date format is inconsistent with the format outlined in REQ-S1.

REQ-N1: Users should be able to locate a reservation based on the date they made the reservation.

This requirement is inconsistent with REQ-E1, which indicates additional ways to locate reservations. It also lacks correctness.

REQ-P2: The destination country code should be shown on the confirmation page for all overseas flights.

There are no blatant issues with this SRS.

REQ-M1: The system shall be completed in 3 months with 5 software developers.

This is not an SRS, but a process requirement, which is inappropriate in this context.

Quality Attributes on set 2 as a whole:

Overall, this set of requirements has several consistency and completeness issues as pointed out in the above examples, especially with the requirement that uses etc. to allude to other portions of the requirement that are not described. As with the previous set of requirements, this set has a good level of forward traceability, but is lacking in backward traceability.