Assignment 01

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1 Exercise 1

1.1 What is meant by "knowledge acquisition is not sequential"? Provide a concrete example of knowledge acquisition that illustrates this:

New knowledge may invalidate or prove previous knowledge wrong about the same subject.

For instance, it was once thought tomatoes were poisonous in the 1700's, and the aristocrats who ate them died. But it was later discovered that due to the high lead content in their plates, and the acidic juices of the tomato, caused lead to leech into the food they were eating, causing lead poisoning. Leading to the abandoning of the old invalid knowledge that tomatoes are poisonous. Article about it

2 Exercise 2

2.1 Specify which of the following decisions were made during requirements or system design:

1. "The ticket distributor is composed of a user interface subsystem, a subsystem for computing tariff, and a network subsystem managing communication with the central computer."
2. "The ticket distributor will use PowerPC processor chips."
3. "The ticket distributor provides the traveler with an on-line help."

2.2 Answer:

The 1st was made during systems design.

The 2nd was made during requirements.

The 3rd was made during requirements.

3 Exercise 3

3.1 In the following description, explain when the term account is used as an application domain concept and when as a solution domain concept:

"Assume you are developing an online system for managing bank accounts for mobile customers. A major design issue is how to provide access to the accounts when the customer cannot establish an online connection. One proposal is that accounts are made available on the mobile computer, even if the server is not up. In this case, the accounts show the amounts from the last connected session."

3.2 Answer:

In the sentence "Assume you are developing an online system for managing bank accounts for mobile customers.", it is implied here that the term account is part of the solution domain, due to the fact that it specifically mentions you developing a system with accounts involved, and that system is part of the solution.

In the sentence "A major design issue is how to provide access to the accounts when the customer cannot establish an online connection.", it is implied here that the term account is part of the application domain, due to the text describing the accounts as an real-world entity and part of a problem.

In the sentence "One proposal is that accounts are made available on the mobile computer, even if the server is not up." accounts are again implied here to be part of the application domain, due to the fact the text is treating it as an external entity or problem that needs to be handled.

In the last sentence "In this case, the accounts show the amounts from the last connected session." it is implied this is part of the solution domain, e.g what the accounts should be like on mobile.

4 Exercise 4

4.1 Question:

A passenger aircraft is composed of several millions of individual parts and requires thousands of persons to assemble. A four-lane highway bridge is another example of complexity. The first version of Word for Windows, a word processor released by Microsoft in November 1989, required 55 person-years, resulted into 249,000 lines of source code, and was delivered 4 years late. Aircraft and highway bridges are usually delivered on time and below budget, whereas software is often not. Discuss what are, in your opinion, the differences between developing an aircraft, a bridge, and a word processor, which would cause this situation.

4.2 Answer:

Hardware keeps getting better, but changing or adapting to new hardware requires changing the existing software that you are developing to make sure it runs on the new hardware. This can take time. Software also have to comply with other existing software - mainly the software frameworks it runs on, like OS's and/or new coding frameworks.
So compared to bridges and airplanes - there is already a lot of knowledge about building and constructing bridges and airplanes, and they both have to comply with the laws of physics, and have specific purposes.

Software however does not necessarily have to comply to any written standards/laws. There can be developed software for something that has never had software been developed for it before, completely new systems, which no one has any prior knowledge of how to do so.

5 Exercise 5

5.1 Specify which of these statements are functional requirements and which are nonfunctional requirements:

1. "The TicketDistributor must enable a traveler to buy weekly passes."
2. "The TicketDistributor must be written in Java."
3. "The TicketDistributor must be easy to use."
4. "The TicketDistributor must always be available."
5. "The TicketDistributor must provide a phone number to call when it fails."

5.2 Answers:

1st is a functional requirement

2nd is a non-functional requirement, it specifies development requirements.

3rd is also a non-functional requirement - it describes Usability requirements.

4th is also a non-functional requirement, it specifies a operational requirement, that the system must always be available.

5th is a functional requirement as it is set up as a goal that the machine must be able to accomplish.

6 Exercise 6

6.1 What is the purpose of modeling?

6.2 Answer:

Modeling helps represent and communicate what is important in a, e.g, future software system, via. abstractions. During modeling one may find missing classes or operations needed for the software to be able to solve a problem, or when modeling, more requirements/missing requirements might be discovered.