

Tutorial

ICDT 6001: Software Engineering

Question 1

- (i) Suggest who might be stakeholders in a university student records system?
- (ii) Explain why it is almost inevitable that the requirements of the different stakeholders will conflict in some way
- (iii) Eliciting and understanding stakeholder requirements is difficult for several reasons. Identify the reasons underlying the difficulty.

Question 2

A flood warning system is to be procured by a river authority which will give advance warning of possible flood dangers to sites which are threatened by floods. The goal of the system is to reduce the disruption caused by flooding. This flood warning system will cover all of the major rivers in the river authority's area. The system is intended to replace an existing warning system that relies on manual reading of sensors.

The system will include a set of automated sensors to monitor the rate of change of river levels and send this information to a central river database; links to meteorological systems giving weather forecasts; links to the communication systems of emergency services (police, coastguard, etc.); video monitors installed at selected locations; and a control room equipped with multi-media operator consoles and video monitors.

Controllers can access database information, display it graphically and integrate the input from the video monitors into their display.

The system database includes information about the sensors, the locations of sites at risk and the threat conditions for these sites (e.g. high tide, south-westerly winds), tide tables for coastal sites, the inventory and location of flood control equipment, contact details for emergency services, local radio stations, etc.

Information about flood control equipment is already maintained by the river authority in an existing relational database. Historical information about river levels is also maintained in a set of files, one file per river. Radio equipment that is compatible with the equipment used by the police is available.

The current flood information control room has recently been re-equipped with SUN workstations as operator consoles. The river authority has a number of IT staff who are trained in C, C++ and in the use of Oracle databases.

Suggest three plausible functional & non functional requirements for the flood warning system that is described above

Question 3

You have been awarded the contract to design the computers system for a new park, that is going to host the most dangerous animals on earth. The initial statement of requirements is given below. Study it and answer the questions that follow:

The computer system shall monitor the movements of all animals in the park, as well as the movements of the game warden in order to be able to prevent attacks.

Each animal will be fitted with a small radio transmitter, which will emit a signal at frequent intervals. The signals will be picked up by three receivers, which will relay to the central computer the direction from which each signal from each animal was received. The central computer shall analyze these signals in order to calculate the position of each animal. The position of the animals shall be computed within 0.1 seconds.

The pens enclosing each species will be surrounded by electric fences to prevent them from straying into one another's areas, or onto the road used by the tourist. The computer system shall detect any damage to any of these fences and raise an alarm when necessary. An alarm shall be raised if any animal strays out of its closure.

The interface of the system shall be menu-based so that it will be easy to use by staff in the control centre. It shall automatically "beep" the veterinary, if any animal is injured. The system shall be ready for the planned opening of the park next July, and shall not cost more than Rs 5 million.

- (a) Write down three functional and non- functional requirements, quoted from the text above.

[6 marks]

- (b) Requirements should state what a system should do, without stating how it should do it. Why is this distinction useful?

[2 marks]

- (c) Why stakeholders should be consulted during requirement engineering process.

[2 marks]

- (d) Requirement specification may yield some problems stemming from the use of natural language. Suggest what problems may be encountered and what alternatives are available for requirements specification

[4 marks]