Pearl Test 111 – Requirements Engineering,
Thu 26 Oct 2017, 8:45–9:45

Program: Technical Computer Science, University of Twente
Module: Pearls of Computer Science (201300070)
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- *During this test you may consult one A4 sheet (both sides) with notes.*
  Simple calculators are generally allowed for pearl tests, but you won't need one here.
  Any other materials are not allowed.
- *Grade = #points/10.*

Questions 1–3 relate to the course materials.

1   (a) What are the four phases of a project according to PMBOK?   (10 pt)
    (b) If you were asked to define a fifth phase, what should it be? Why?

2   In Energy Demand Management, the price of electricity varies across the day in   (10 pt)
order to discourage electricity consumption in periods where demand is higher
than supply. Possible requirements include:
(a) "The system should allow the electricity company to monitor overall usage
    in real time";
(b) "The system should allow consumers to know electricity prices at least 24
    hours in advance"
(c) "The system should allow users of electric cars to determine when it is
    cheapest to recharge their car.
In each case: is it a goal-level requirement, a business-level requirement, a
system-level requirement or a design-level requirement? Why do you think so?

3   (a) Give a definition of a ~~non-functional~~ *quality* requirement.   (10 pt)
    (b) Give an example of a constraint.

Questions 4–6 relate to the case study on page 2.

4   For a mission statement, write the paragraphs *Motivation, Goal of the system*   (20 pt)
and *Exclusions*. (Skip *Type of system* and *Approach*.)

5   The "onion-model" has stakeholder roles in multiple layers around the software   (20 pt)
system, including (but not limited to):
The System: Normal Operator, Maintenance Operator, Operational Support;
The Containing System: Purchaser, Functional Beneficiary, Interfacing System
Owner; *The Wider Environment*: Developer, Sponsor, Champion, Politician,
Functional Beneficiary, Negative Stakeholder, Regulator, The Public.

    (a) Which stakeholders are mentioned in the text? To which roles do they fit?

    (b) Give the three most essential stakeholder roles for which no stakeholder is
    mentioned in the text.

6   Give <u>all</u> user stories for the repair service module.   (30 pt)
    Give appropriate acceptance criteria for <u>one</u> of these user stories.

Webshop Repair Service

Aaron's Audio Accessories used to be a physical shop for high-end audio equipment in Rotterdam. As the number of customers declined over the years, AAA became a webshop three years ago. Since then, business has been going up steadily. However, also increasing is the number of broken products that are returned to the service department for repair or replacement.
the service department, to which customers can return products that need to be repaired, is turning into a bottleneck. In order to maintain AAA's high reputation, it is important that this service runs smoothly as well.
When equipment breaks down which has been purchased from AAA, it can be returned for repair. Most products have a warrantry period of several years. Repair within the warrantry period (or, if repair is not possible: replacement) is free of charge.
Aaron (still the CEO of AAA) sought expert advice, and a new process has been designed (see below) which should automate some clerical tasks and allow better coordination within the Service Department. In future it can be extended with an expert system to help Technical Service with the repairs, most important for now is to rationalize the process.
The next step is to construct a software module to support this process.

When a product needs repair, the customer phones the Customer Service department. Customer service staff creates a *service record* with a summary of the experienced problems. By (searching and) selecting the orginal purchase order number, essential data about the product and the customer will automatically be included in the service record. The service record will assist Customer Service and Technical Service in coordinating the repair, they can look up the service record whenever they need.
When a service record is created, the system automatically sends an e-mail to the client with the summary of the experienced problems and further instructions. Attached is a return label for the postal services, addressed to a freepost number (postage to be paid by recipient) of AAA's Technical Service department. Also, the label carries a bar code that links it to the service record.
The customer should deliver a parcel with this label to the post office.

When the parcel arrives, Technical service staff registers arrival by scanning the bar code on the label and makes sure that it gets to the right repair team.   ·: ·. · · · ·
If warrantry no longer applies, the first task is to assess what is wrong with the product, whether it can be repaired and what the estimated repair costs are. When technical Service staff adds a cost estimate (with explanation) to the service record, an e-mail with the cost estimate is automatically sent to the customer. This e-mail includes a link to a web form where the customer can indicate
- whether s/he gives permision to repair the article for the stated costs;
- if it the product is to be repaired, a bank account or credit card number to which the repair costs can be debited;
- if repair is not possible, or deemed too expensive by the customer, whether s/he would like to get the broken product returned or let AAA dispose of it in an environmentally friendly way.

When a client has given permission, technical service staff will carry out the repair. When needed, the service record can be updated with notes about the repair and costs involved. When the repair is finished, the product goes to Customer Service, who will take care of sending the product back to the customer and finalizing the service record. When Customer Service staff finalizes the service record, they may rephrase the notes of the technical service department in a more customer-friendly way. Upon finalization, an address label for a parcel is printed and the costs (up to the indicated estimate) are automatically debited to the customer's account number.

If warrantry applies, the process is simpler, because no permission from the customer is needed. The article will be repaired if possible. Otherwise the 'repair' consists of replacing it with a new product.