SE-4831 Software Quality Assurance

Lab 8: Constructing an Operational Profile

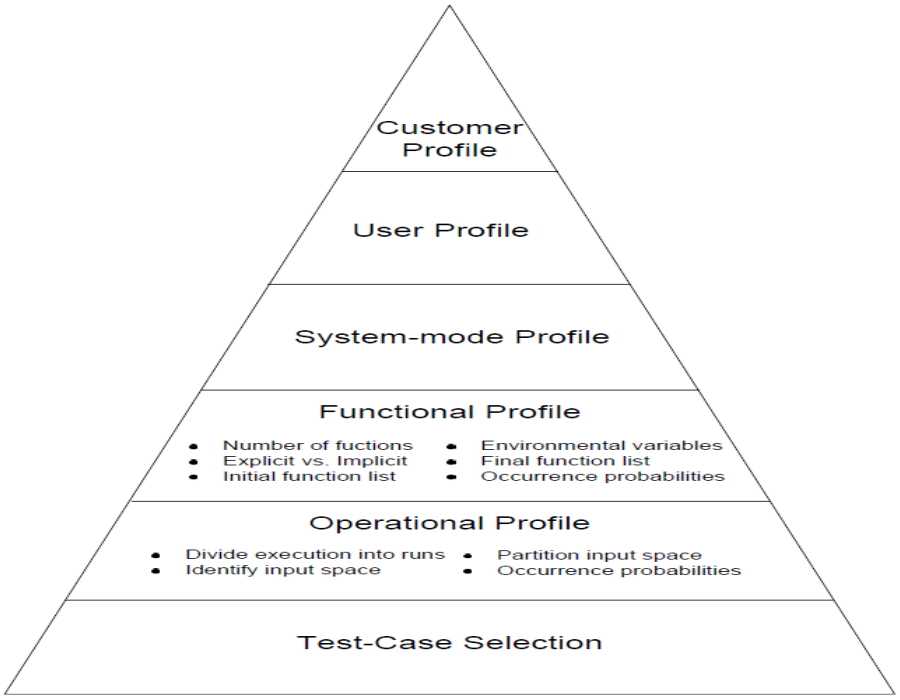
Due by 23:00 February 3, 2013

Objectives

- Create a customer profile for your product
- Create a User profile for your software
- Construct an operational profile for the functionality of your system

Introduction

As was discussed in class, an important piece to understand about a system is the operational profile. By definition, "An operational profile is a quantitative representation of how a system will be used. It models how users execute a system, specifically the occurrence probabilities of function calls and the distributions of parameter values. Such a description of the user behavior can be used to generate test cases and to direct testing to the most used functions."[1]



As is shown above, operational profiles tie in the definition of the customers, the users, and the system modes to determine the functional profile, which leads to the operational profile.

[1] Operational Profiles for Software Reliability, Heiko Koziolek, 9th September 2005.

The customer profile consists of a complete group of the customers for the system as well as their associated probabilities. Customers are, by definition, the persons, groups, or institutions that purchase a software system. It may be that your software only has one customer type. In that case, then there may not be a need for a separate grouping of customers.

The user profile explains the persons, groups, or institutions that use a software package. Example user groups might be system administrators, maintenance users, regular users, and system guests.

The systems modes represent the different modes that your system can operate in. For example, your system might have batch mode or interactive mode. In many modern systems, there may only be one mode.

The operational profile explains which functions of a given software package are used and how often they are invoked. The operational profile then allows one to focus on the development tasks at hand.

Lab Specifics

As a team, start by defining the customers for your product. Who are they, and what are their distributions. For example, Microsoft office might have 80% institutional users and 20% individuals users in its customer profile.

Once you have the customer profile defined, for each customer type, define a set of users. The users most likely can be derived directly from a use case diagram. If your project does not have a use case diagram, you may find it helpful to sketch a use case diagram as part of this step. Again, when defining the users, you'll want to know what relative probability there is for each user.

For most of your senior design projects, there probably will not be different modes. But if there are, you'll want to categorize them.

Once this is completed, you'll want to define the operations that your system supports. The operations are related to the use cases and use case scenarios developed as part of your requirements analysis for your senior design project. What you will want to do is develop for each customer and each user an operational profile, an example of which is given in the figure below. Once you are done, you will combine this together to create an overall operational profile.

Android Smartphone Example Operational Profile
Customer: Residential Customer
User: Soccer Mom

Operation	***Occurrence Rate (Operations per day)***	***Occurrence Probability***
Read instant message	*100*	0.341297
View e-mail.	*75*	0.255973
Check calendar	*25*	0.085324
Add appointment to calendar.	*5*	0.017065
Send instant message	*20*	0.068259
Send e-mail.	*20*	0.068259
Make phone call.	*5*	0.017065
Answer incoming phone call.	*10*	0.03413
Check voice mail.	*5*	0.017065
Check weather forecast	*5*	0.017065
Check local gasoline prices.	*1*	0.003413
Check local traffic	*4*	0.013652
Log exercise	*2*	0.006826
Log calories consumed	*3*	0.010239
View photo from friend.	*5*	0.017065
Take photo.	*2*	0.006826
Take video.	*1*	0.003413
Send photo to friend.	*5*	0.017065

Deliverables

Each team shall submit a report in pdf format with the following information

1. *Title Page*
    a. Name of all team members,
    b. course
    c. date details.
2. Customer analysis
    a. Describe the customers for your system. Who will be purchasing your software? How many customers are there, and what is their relative probability? Describe each customer and how they are different in a few sentences.
3. User Analysis
    a. Who are the various users of the system? How many are there and what is their percentage(s)? Again, describe each user in a few sentences. You might also draw a use case diagram to aid in this explanation. If you have multiple customers, you might draw multiple use case diagrams, one for each customer.
4. *System Mode Analysis*
    a. If applicable, describe each system mode.
5. Operational profile

   a. Include a table of each operation as well as a description of the customer and user, showing the occurrence rate. While the example shows operations per day for a given user, a more appropriate unit may exist for your project. Feel free to use it as applicable.
   b. Include a table showing the complete operational profile, which is the result of combining all operational profiles together. The occurrence probability would be the probability of each profile multiplied by the occurrence probability for that profile.
6. *Things gone right / Things gone wrong –*
   a. Discuss the things which went well with this lab,
   b. Discuss the problems with the lab.
7. *Conclusions*
   a. What have you learned from this experience?
   b. How can you use this information to aid in planning your springs and or testing your software application?