

Case Module: Developing an Operational Profile
Prerequisite Knowledge: enrollment in a software engineering course
Learning Objectives: Upon completion of this module students will have increased ability to: <ol style="list-style-type: none"> 1. Examine needs and requirements documents to determine an operation list 2. Establish and compute operation occurrence rates and occurrence probabilities 3. Review a operational profile 4. Describe the advantages of developing an Operational Profile
Keywords: Operation List, Occurrence Rates, Operational Profile
Case Study Artifacts: <ol style="list-style-type: none"> 1. DH Customer Need Statement 2. DH High Level Requirements Definition (HLRD) 3. DH Background Scenario 4. DH Team Biographical Sketches 5. DH SRS, Version 1.3
Case Study Participants: <ul style="list-style-type: none"> • The DH Team • A representative from the HomeOwner Marketing Division
Scenario: <p>In early September of 2010, HomeOwner Inc. (the largest national retail chain serving the needs of home owners) established a new DigitalHomeOwner division that was set up to explore the opportunities for equipping and serving “smart houses” (dwellings that integrate smart technology into every aspect of home living). In August and September of 2010, the Marketing Division of HomeOwner conducted a needs assessment for a DigitalHome (DH) product that would provide the computer and communication infrastructure for managing and controlling the “smart” devices into a home to best meet the needs and desires of homeowners. The Marketing Division produced two documents: the <i>DH Customer Need Statement</i> and the <i>DH High Level Requirements Definition (HLRD)</i>.</p> <p>Using the documents developed by marketing, DigitalHomeOwner has launched a pilot project (called the DH project) to examine and assess the technical and developmental issues of the smart house concept. A five person team was assembled for the project in early September 2010. After project launch, the team prepared a project plan and completed a <i>Digital Home Software Requirements Specification (SRS)</i> in October 2010.</p> <p>During the development of the SRS, Jorge Ortiz, the DigitalHomeOwner Director, of the DH Project, emphasized to Disha Chandra, the DH team leader, the importance of system reliability. In response, Disha, based on her experience at SoftMedic, suggests that the team should prepare and use a DH operational profile. Jose agrees and asks Disha to have her team prepare an initial version. Disha requests the assistance of someone from marketing to help the team with the development of the initial version of the operational profile. Jose contacted the Marketing Division Head and set up a meeting between the DH Team and Karen Mullen, the lead for the DH needs assessment effort.</p> <p>On the Friday, the DH team meets with Karen and begins its work in a DH Operational Profile.</p>

Exercise:

1. As preparation for the case method, ask each student to read the Case Study Artifacts listed above.
2. Divide the class into a set of small teams (3-4 people).
3. Each team takes on the role of a DH Team member or of Karen Mullen. The team is asked to carry out the following tasks:
 - a. Identify initiators of operations
 - b. Create an operations list
 - c. Review the operations list
 - d. Determine occurrence rates and probabilities
 - e. Document their work in the Operational Profile Form in the Exercise Booklet
 - f. Review the Operational Profile and revise as needed.

Appendices:

Exercise Booklet

Resource Information:

Musa, John D., *Software Reliability Engineering: More Reliable Software, Faster and Cheaper*, 2nd Ed, AuthorHouse, 2004.

Teaching Notes:

- This case module could be best used in an upper level undergraduate or graduate course in requirements engineering or software V&V. Students will need some prior discussion of software reliability and operational profiles.
- Although this case module is designed as a team exercise, there are a couple of other ways the case could be used:
 - This could be a teacher-led discussion of the issues related to the Operational Profile and the DH SRS and V&V efforts – making it a brainstorming session.
 - Students could be assigned as an individual homework assignment of studying the case module materials and completing the Operational Profile Form.
- Assuming an adequate student preparation for the exercise, allowing students about 45 to 60 minutes for the exercise should be sufficient. The exercise should be followed with a 15-20 minute discussion concerning the student team results. Some key questions/points to include in the discussion are the following:
 - Combine/aggregate the results and display, and then discuss similarities and difference. Why were some operations included and other not? Why are there differences in occurrence rates between teams?
 - How would the Profile be valuable in V&V activities?
 - In the developing the DH product how should cycles/released be organized?
 - In assembling the Profile, did you spot any shortcomings in the SRS?
- Student teams should be cautioned about a few things:
 - This case module is concerned with only the initial Profile development. The Profile will be reviewed and refined throughout the software lifecycle.
 - The meeting lasts for only one hour, so the team needs to think about how best to use the time.
- If the course involves actual student development teams, this exercise could provide a good team building experience: it could be carried out at the beginning of a course; it does not require any special technical knowledge; and everyone can participate.