

Lecture 11

Communicating the Requirements: Fit Criteria

Com S/SE 409/509

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HW3 posted later this week; due 10/15

Exam 1 update

- Graded & posted
- High: 96; Median: 81
- Scores, not letter grades, recorded
 - A 93-100
 - A- 90-92
 - B+ 87-89
 - B 83-86
 - B- 80-82 . . .
- Regrade requests in Gradescope by 10/1
- Midterm grades based on HW1, HW2 & Exam 1

Fit criteria: Chap. 12

A requirement needs to be *testable*

NOT: “The interface shall be ~~user-friendly~~.”

To be testable, it needs to be measurable

The test then can show whether the requirement is met

Def’n: A fit criterion is the measurement of a requirement.

“A fit criterion associated with a statement quantifies the extent to which this statement must be satisfied.” [van Lamsweerde]

Scale of measurement: unit used to test conformance of software product to its requirement

Ex: “time to learn”?

“how much staff uses it?”

“error rate of work done using product?”

Example: Fit criterion for “The interface shall be user-friendly”

Non-Functional Requirement

“New users shall be able to add a road, change a road & delete a road within 30 minutes of their first attempt at using IceBreaker.”

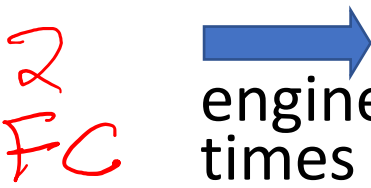
- measurable
- units: minutes, new users
- Testable!

Fit criteria are most commonly needed for nonfunctional requirements

 Example Nonfunctional requirement:

“IceBreaker shall produce the road de-icing schedule in an acceptable time.”

 Now make it testable: specify how to **show** that requirement is met

 Fit criteria: “The road de-icing schedule shall be available to the engineer within 15 seconds from when they make a request for 90% of the times that it is requested. It shall never take longer than 20 seconds.”

- Fit criteria are usually determined after requirements are first described
- Fit criteria make requirements testable.

How can we find good fit criteria?

- Ask client, “What is the rationale (reason) for this requirement?”
- Ask, “What would you consider to be a failure to meet this requirement?”
- May take some back-&-forth with client to figure out appropriate fit criteria
- May take user panels or prototyping to figure out how to measure users’ satisfaction levels
- 1-to-many: to make one requirement testable, may need several fit criteria

Reqs - to - Fit Criteria

Fit criteria for functional requirements

Ex Functional requirement:

“IceBreaker shall record the weather station readings.”

Now make it testable: specify how to show that the product has correctly carried out the action it must take.

 Fit criterion:

“The recorded weather-station readings shall be identical to the readings recorded at the transmitting weather station.”

Additional benefits & caveats

- Use fit criteria to guide test generation
 - Use fit criteria to assess alternative options
 - (509) Use fit criteria to quantify the extent to which a soft goal (preferences) should be met.
 - “The product shall allow for 3,000 downloads/hr, although 5,000/hr is preferred.”
 - Note: Fit criteria may be contractual, so be careful
 - Note: Overly strict fit criteria cause unneeded labor/time/cost, so be careful [https://dl.acm.org/doi/10.1109/MS.2017.53]
- fit criteria \neq test*
- feasible*
- appropriate*