



Fit Criteria and Rationale

Lecture Objectives:

- 1) Define Fit Criteria ✓
- 2) Define Rationale for a requirement ✓
- 3) Define fit criterion for a set of requirements ✓
- 4) Explain different techniques for expressing fit criteria. ✓
- 5) Explain how fit criteria can be expressed for implementation constraints. ✓

Fit Criteria

- Requirement R1
 - The laptop assigned to MSOE students shall be light.

What is light?
50# or less
white not black.

Fit Criteria

- Requirement R1
 - The laptop assigned to MSOE students shall be light.

- ⇒ Keep users happy?
- ⇒ We want convenience.
- ⇒ Mobility
- ⇒ Shipping costs (Maybe)
- ⇒ Notebooks, books, power supplies, cables, etc.

- Requirement R1

- Description

- The laptop assigned to MSOE students shall be light.

- Rationale

- Students need to be able to carry the laptop and 4 textbooks in their backpack.

Fit Criteria

Why this is important.

How do we measure how well the requirement meets our needs.

Fit Criteria

- Requirement R1
 - Description *of "What"*
 - The laptop assigned to MSOE students shall be light.
 - Rationale *of why*
 - Students need to be able to carry the laptop and 4 textbooks in their backpack.
 - Fit Criterion
 - The selected MSOE laptop and power supply shall weigh no more than 5 pounds.

*Quantitative,
can be tested.*

Definitions

- Rationale
 - Rationale expresses the reason that a requirement is necessary. — why?
 - It is the justification for the given requirement.
 - Provides guidance for selecting the fit criteria.
- Fit Criteria — Develop tests
 - The quantitative measurement of a requirement -
 - Provides a basis for the development of tests to verify compliance with the requirement

Scale of measurement

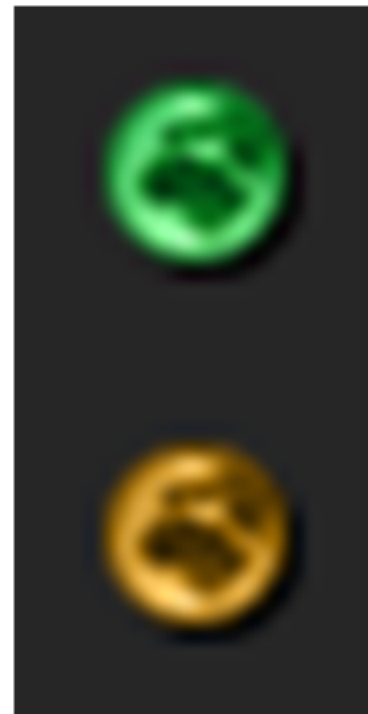
- Any requirement can be measured
- Scale — Unit
 - The unit of ~~measure~~ for the requirement
 - Depends on what is being measured
 - Time — *Response time*
 - Size —
 - Color —
 - Action counts =
 - Etc.



How many clicks?

Problem

- A system uses the icons below to indicate the status of a photograph in an online repository. The color changes whenever the status changes. What is wrong with this design?



→ Color 1

→ Color 2

URL Of Example

- <http://simplifiedream.net/2009/02/24/color-blindness-and-user-interface-design/>

Problem

- Description
 - All user indications shall be clearly differentiable to those who suffer from diminished color awareness.
- Rationale:

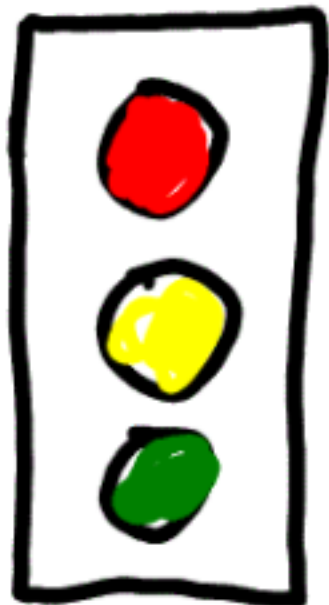
Valid? Yes.

Problem

- Description
 - All user indications shall be clearly differentiable to those who suffer from diminished color awareness.
- Rationale:
 - 7% of the male population exhibits signs of color blindness.
- Fit Criterion

Problem

- Description
 - All user indications shall be clearly differentiable to those who suffer from diminished color awareness.
- Rationale:
 - 7% of the male population exhibits signs of color blindness.
- Fit Criterion
 - All status icons shall be distinguishable based on attributes unrelated to color.



Applications of fit criteria

- Non functional requirements ✓

- Look and feel -
- Performance -
- Maintainability -
- Security -
- Cultural .
- Legal .
- .
- .
- .

Things with
no associated
functionality.

Usability (Web context)

- Description:
 - The MSOE web site shall allow easy navigation to any desired material.
- Rationale:

Usability (Web context)

- Description:
 - The MSOE web site shall allow easy navigation to any desired material.
- Rationale:
 - Students need to find the information they are looking for quickly. Otherwise, they will e-mail someone and the e-mail server will crash due to too many emails.
- Fit Criteria

Usability (Web context)

- Description: — *What*
 - The MSOE web site shall allow easy navigation to any desired material.
- Rationale: — *Reason*
 - Students need to find the information they are looking for quickly. Otherwise, they will e-mail someone and the e-mail server will crash due to too many emails.
- Fit Criteria — *Testable*
 - All desired information shall be locatable by clicking on no more than 5 clicks from the main page.

Performance Requirement

- Description
 - The MSOE Registration system shall be reliable.
- Rationale
 - If the system is unreliable, students will be forced to use the registrar office, increasing the need for manpower and increasing tuition expenses.
- Fit Criteria: *Measure?*

⇒ 80% of students can register online?

Performance Requirement

- Description
 - The MSOE Registration system shall be reliable.
- Rationale
 - If the system is unreliable, students will be forced to use the registrar office, increasing the need for manpower and increasing tuition expenses.
- Fit Criteria: *Reliability*
 - The MSOE web system shall be available 99.9% of the time between the hours of 8:00 am and 17:00 CDT Monday through Saturday.

Maintainability Requirements

- Description *"Vague"*
→ The system shall be easy to maintain.
- Rationale

Maintainability Requirements

- Description
 - The MSOE schedule generator shall be easy to maintain.
- Rationale
 - It is expensive to employ highly skilled IT experts and the students who developed the system will graduate.

Maintainability Requirements

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 - The MSOE schedule generator shall be easy to maintain.
- Rationale
 - It is expensive to employ highly skilled IT experts and the students who developed the system will graduate.
- Fit Criterion
 - The product shall build automatically from an automated build script whenever the developers issue a command to build a given version.
 - It shall take no more than 5 minutes to perform a clean build on the project from scratch.

Functional Requirement

- Description
 - The taillights on a Ford Mustang shall turn on quickly after the user presses the brake pedal.
- Rationale
 - *Avoid an accident by being rear ended.*

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 - The taillights on a Ford Mustang shall turn on quickly after the user presses the brake pedal.
- Rationale
 - The tail lights will indicate to a driver of following vehicles that the lead driver is going to stop.
- Fit Criteria

Functional Requirement

- Description
 - The taillights on a Ford Mustang shall turn on quickly after the user presses the brake pedal.
- Rationale
 - The tail lights will indicate to a driver of following vehicles that the lead driver is going to stop.
- Fit Criteria
 - The tail light shall illuminate within 50ms of the driver stepping on the brake pedal, as at 55 mph, that represents 4 feet of travel.

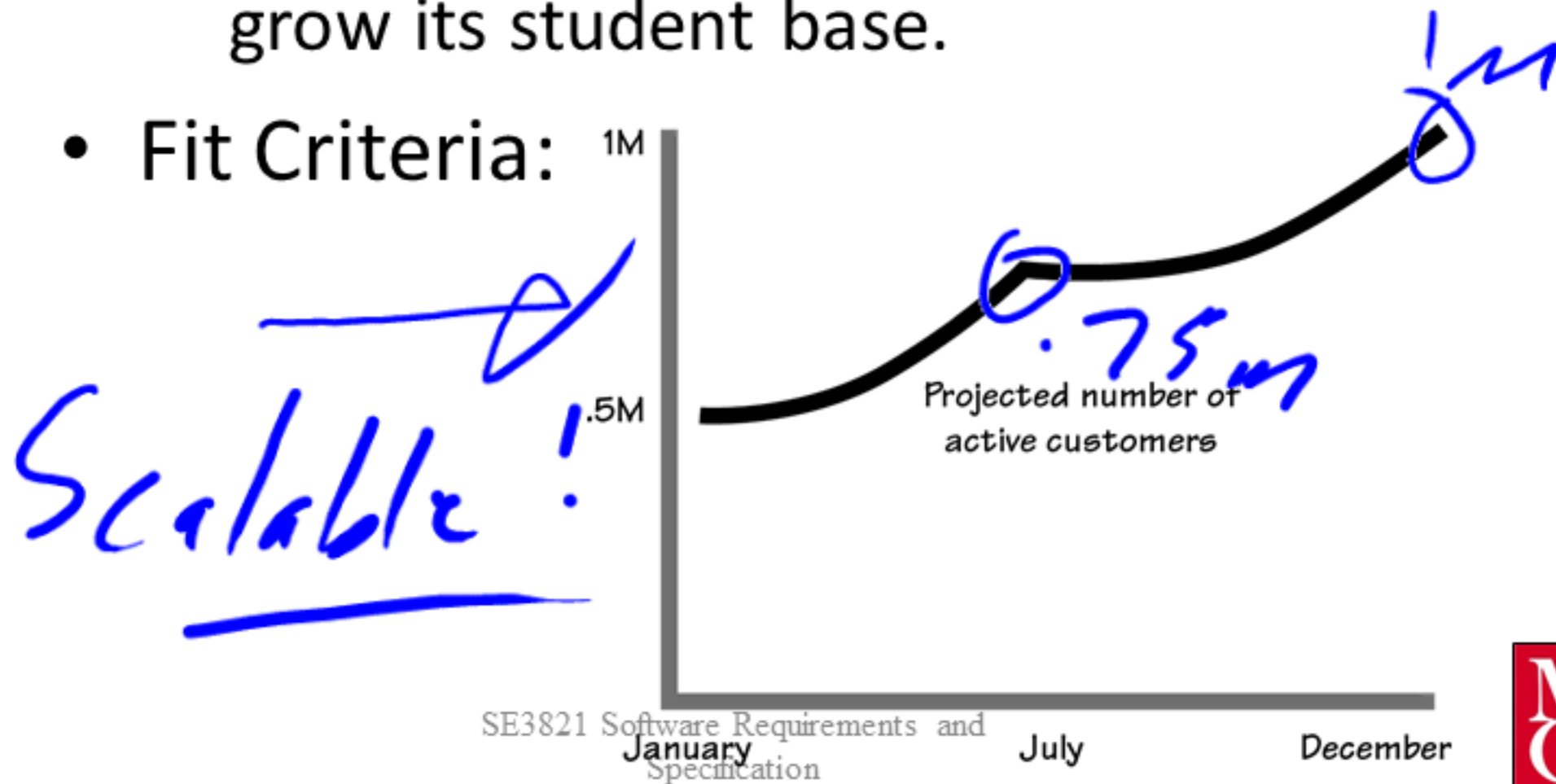
Performance Requirement

- Description
 - The MSOE scheduler shall be capable of expanding as student enrollment increases.
- Rationale
 - In order to keep costs down, MSOE must grow its student base.
- Fit Criteria:

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Constraint example

- Description
 - The software product must run on windows
- Rationale
 - The user base is very familiar with windows PCs, the IT department is familiar with supporting Windows PCs, and Windows 8 is going to be deployed shortly.
- Fit criteria
 - All functionality of the software shall operate as specified when using Windows 7 service pack 2.