

EULER's Quality Annotations

EULER produces one or more of the following annotations for each step to reproduce (S2R) identified from the bug report:

Exact Match (EM): this annotation indicates that the S2R can be precisely matched to an app interaction (e.g., “tap on the OK button”). In other words, the S2R corresponds to a specific interaction in the application or mobile device. For this annotation, EULER shows the matched app interaction for the S2R. The next Figure shows an example of this annotation.

#	Identified Step to Reproduce (S2R)	Quality Annotations for the S2R
2	Click on "... " (More Options...)	EM This S2R matches the following app interaction: 1. Tap the "More options" image button

Ambiguous Step (AS): this annotation indicates that the S2R can be matched to more than one action or GUI component of the app (e.g., “tap on a web link” for screens where there are many web links, or “change the value” where “change” could mean one or more actions: tap, long-tap, or swipe). The next Figure shows an example of this annotation.

#	Identified Step to Reproduce (S2R)	Quality Annotations for the S2R
1	Enter fillup data	AS This S2R matches multiple GUI components (e.g., the "text 1 (Extra data)" text view or the "text 1 (Fillup information)" text view).

Vocabulary Mismatch (VM): this annotation indicates that vocabulary of the S2R does not match the vocabulary of the application (e.g., “tap on element” for applications where the term “element” is not used in any of its screens). The next Figure shows an example of this annotation.

#	Identified Step to Reproduce (S2R)	Quality Annotations for the S2R
6	Long click on Element	VM The term "on Element" does not match a GUI component from the app.

Incorrect Input Value (IV): this annotation is for steps that are about typing or entering an input value into the application (e.g., “enter the task name”). The annotation indicates the S2R does not provide a specific input value (e.g., “enter the price of an item” instead of “enter \$10 as the price of an item”). The next Figure shows an example of this annotation.

#	Identified Step to Reproduce (S2R)	Quality Annotations for the S2R
1	Enter price per km	IV This S2R's input value is missing or incorrect. An example of a valid value is: 5

Missing Steps (MS): this annotation indicates that before executing this S2R in the application there are other app interactions (or steps) that should be executed before the current S2R for reproducing the bug.

For example, suppose that the only S2R present in a bug report is “tap on menu option X”. Suppose that this action requires that the menu Y is opened first, i.e., the menu where the menu option X is located. In this case, “open menu Y” is a missing step (or interaction) because it is not described in the bug report and should be executed before “tap on menu option X”. The next Figure shows an example of this annotation.

#	Identified Step to Reproduce (S2R)	Quality Annotations for the S2R
2	Long click on item	MS There are app interactions that are missing in the bug report and should be executed before this S2R: <ol style="list-style-type: none">1. Tap the image button2. Tap the drop down list3. Tap the list view