

Appendix E

Usability Evaluation

This appendix presents the results of the usability analysis evaluation of the four refactoring tools Eclipse 3.2, Condenser 1.05, RefactorIT 2.5.1 and Eclipse 3.21 with the Simian UI 2.2.1.2 plug-in. The requirements used for this analysis are those that were presented in Appendix D, developed from the set of usability guidelines presented in Appendix C.

E.1 Consistency

Requirement	Eclipse Complies (0,0.5,1)	Notes/ Comments	Condenser Complies (0,0.5,1)	Notes/ Comments	RefactorIT Complies (0, 0.5, 1)	Notes/ Comments	Eclipse with SimianUI Complies (0,0.5,1)	Notes/ Comments
1	1		0 (N/A)	Is not integrated with an IDE	1		1	
2	1		0.5	Command line complies with Unix cmd standards	1		1	
3	1		0	Is not integrated and no attempt to match any ide	1		1	
4	1		0	stand alone code smell detector	1		1	
Total C	4		0.5		4		4	

E.2 Errors

Requirement	Eclipse Complies (0,0.5,1)	Notes/ Comments	Condenser Complies (0,0.5,1)	Notes/ Comments	RefactorIT Complies (0, 0.5, 1)	Notes/ Comments	Eclipse with SimianUI Complies (0,0.5,1)	Notes/ Comments
5	1		0		0 (N/A)	No editing capabilities. Only file input.	1	
6	1		0		1		1	
7	1		1		1		1	
8	0.5		1		1		1	
9	1		0		1		1	
10	1		0		1		1	
11	1		0		0		1	
12	0		1		0.5		1	
13	0	No code smell detection in standard environment.	0		0.5		0	
14	1		0		1		1	
15	0	No code smell detection in standard environment.	0	Not integrated with a transformation tool!	0.5	Only detection and proposal to remove for coding style violations	0.5	No transformation proposal and only 'duplicate code' code smell supported.
16	0		1		0		1	
17	0	Note there are plugin tools for this, but not part of standard environment	0		1		0	
18	1		1		1		1	
19	0		0		0		0	
Total E	8.5		5		10.5		11.5	

E.3 Information Processing

Requirement	Eclipse Complies (0,0.5,1)	Notes/ Comments	Condenser Complies (0,0.5,1)	Notes/ Comments	RefactorIT Complies (0, 0.5, 1)	Notes/ Comments	Eclipse with SimianUI Complies (0,0.5,1)	Notes/ Comments
20	0.5		0		0		0.5	
21	1		0		0		1	
22	1		0		0		1	
23	1		0		1		1	
24	1		0		1		1	
25	1		0		1		1	
26	1		1		1		1	
27	1		0		1		1	
28	1		0		1		1	
29	0.5	Some abstractions through project tree view; plugins available for visualisations	0		1		0.5	As per Eclipse
Total IP	9		1		7		9	

E.4 User Experience

Requirement	Eclipse Complies (0,0.5,1)	Notes/ Comments	Condenser Complies (0,0.5,1)	Notes/ Comments	RefactorIT Complies (0, 0.5, 1)	Notes/ Comments	Eclipse with SimianUI Complies (0,0.5,1)	Notes/ Comments
30	1		1		1		1	
31	1		0		0		1	
32	1		0		1		1	
33	1		0		1		1	
34	1		1		1		1	
35	1		0		1		1	
36	0	No code smell detection in standard envi- ronment.	1		1		1	
37	1		0	No transforma- tions available	1		1	
38	0	No code smell detection in standard envi- ronment.	0	Not integrated tool!	1		1	
39	0	No code smell detection in standard envi- ronment.	0	Not integrated tool!	1		0	Only detection tools uses task viewer, i.e. not integrated.
Total UE	7		3		9		9	

E.5 Design for user

Requirement	Eclipse Complies (0,0.5,1)	Notes/ Comments	Condenser Complies (0,0.5,1)	Notes/ Comments	RefactorIT Complies (0, 0.5, 1)	Notes/ Comments	Eclipse with SimianUI Complies (0,0.5,1)	Notes/ Comments
40	1		0.5	Open source so customisable at that level	0		1	
41	1		0		1		1	
42	1		0		1		1	
43	1		0		1		1	
44	1		0		1		1	
45	0.5	Only one lan- guage set using standard refac- toring terminol- ogy	0.5	Standard refac- toring terminol- ogy used	1		0.5	
46	1		0.5	Open source so customisable at that level	1		1	
47	1		1	No automation of changes to code	1		1	
48	0	No code smell detection or proposal of what refactoring transformation is appropriate in standard environment	0	Supports only code smell detection	0		0	
Total DU	7.5		2.5		7		7.5	

E.6 User Control

Requirement	Eclipse Complies (0,0.5,1)	Notes/ Comments	Condenser Complies (0,0.5,1)	Notes/ Comments	RefactorIT Complies (0, 0.5, 1)	Notes/ Comments	Eclipse with SimianUI Complies (0,0.5,1)	Notes/ Comments
49	1		0		0		1	
50	1		0		1		1	
51	0.5	Not through user interface, though IDE is open source and can be modified by changing the source code	0		0		0.5	As per Eclipse
52	0.5	Not through user interface, though IDE is open source and can be modified by changing the source code	0		0		0.5	As per Eclipse
53	0	No code smell detection in standard environment	0	No short cuts	0		0.5	
54	0	No code smell detection in standard environment	0		0		0.5	
55	0	No code smell detection in standard environment	0		0		0	
56	0	No code smell detection in standard environment	0		0.5		1	

Requirement	Eclipse Complies (0,0.5,1)	Notes/ Comments	Condenser Complies (0,0.5,1)	Notes/ Comments	RefactorIT Complies (0, 0.5, 1)	Notes/ Comments	Eclipse with SimianUI Complies (0,0.5,1)	Notes/ Comments
57	0	No code smell in detection in standard environment	0.5	Open source so new additions can be made at code level	0		0	
58	0	No code smell in detection in standard environment	0.5	Open source so new additions can be made at code level	0		0	
59	0	No code smell in detection in standard environment	0.5	Open source so new additions can be made at code level	0		0	
60	0	No code smell or detection of proposal of what refactoring transformation is appropriate in standard environment	0	No proposals made	0.5		0	
61	0	No code smell or detection of proposal of what refactoring transformation is appropriate in standard environment	0	No proposals made	0		0	
62	0	No code smell or detection of proposal of what refactoring transformation is appropriate in standard environment	0	No proposals made	0		0	

Requirement	Eclipse Complies (0,0.5,1)	Notes/ Comments	Condenser Complies (0,0.5,1)	Notes/ Comments	RefactorIT Complies (0, 0.5, 1)	Notes/ Comments	Eclipse with SimianUI Complies (0,0.5,1)	Notes/ Comments
63	0	No code smell detection or proposal of what refactoring transformation is appropriate in standard environment	0	No proposals made	0		0	
64	0.5	Not through user interface, though IDE is open source and can be modified by changing the source code	0	No transformations available	0		0.5	
65	0.5	Not through user interface, though IDE is open source and can be modified by changing the source code	0	No transformations available	0		0.5	
66	0.5	Not through user interface, though IDE is open source and can be modified by changing the source code	0	No transformations available	0		0.5	
67	0.5	Not through user interface, though IDE is open source and can be modified by changing the source code	0	No transformations available	0		0.5	

Requirement	Eclipse Complies (0,0.5,1)	Notes/ Comments	Condenser Complies (0,0.5,1)	Notes/ Comments	Refactor:IT Complies (0, 0.5, 1)	Notes/ Comments	Eclipse with SimianUI Complies (0,0.5,1)	Notes/ Comments
68	0	No code smell or detection of proposal what refactoring transformation is appropriate in standard environment	0	Reactive mode only (i.e. on demand)	0		0	
69	0	No code smell or detection of proposal what refactoring transformation is appropriate in standard environment	0	No proposals made	0		0	
70	1		0	No transformations available	0		0	
71	0 (N/A)	No proposal in standard environment	0	No proposals made	1		0	
72	0 (N/A)	No proposal in standard environment	0	No proposals made	0		0	
73	0 (N/A)	No proposal in standard environment	0	No proposals made	1		0	
Total UC	6		1.5		4		7	

E.7 Goal Assessment

Requirement	Eclipse Complies (0,0.5,1)	Notes/ Comments	Condenser Complies (0,0.5,1)	Notes/ Comments	RefactorIT Complies (0, 0.5, 1)	Notes/ Comments	Eclipse with SimianUI Complies (0,0.5,1)	Notes/ Comments
74	0	No code smell in standard environment	0	No attempt to notify of progress	1		1	
75	1		0	No transformations available	1		1	
76	0.5	Interface clear and constrained within refactoring wizard, however not so for code smell and proposal stages.	0		0		0.5	
77	0	Undo and redo available but no other mechanism	0		0		0	
78	1	No user actions found to have no response	1	Only available action is running tool	1		1	
79	1	No user actions found to have no response	1		1		1	
80	0	Not available in standard environment although some plugins are available	0		1		0.5	
81	0	No code smell in standard environment	1	Duplication well detected	1		1	
Total GA	3.5		3		6		6	