

A CSCW Requirements Engineering CASE Tool: Development and Usability Evaluation*

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Abstract. An experiment was performed in order to assess the usability of CSRML Tool 2012 (CT'12), a tool to specify the requirements of CSCW systems. The effectiveness and efficiency of CT'12 were evaluated by means of several experimental tasks. Moreover, the user's satisfaction was evaluated by using both a classical survey and analyzing the participants' facial expressions when performing the experiments. Furthermore, this evaluation has been reported by using the ISO/IEC 25062:2006 [2], thus making its results comparable with other usability assessments which follow this international standard. Finally, details about how to develop a CASE tool for a Domain Specific Language was provided in a tutorial style.

Palabras clave: Usability evaluation; CASE tool; CSRML; Requirements engineering; CSCW; ISO/IEC 25062:2006

1 Context of the proposal: RE CASE Tools for CSCW Systems

Part of the success of a Requirement Engineering (RE) technique lies in its supporting tool, with which to specify and validate requirements models. As happens with classical RE techniques, CSRML (Collaborative Systems Requirements Modeling Language) [7] needed a CASE tool to help Requirement Engineers specify requirements for CSCW systems [4]. With this aim CSRML Tool 2012 (CT'12) [6] was developed as a Visual Studio extension to properly specify and validate CSRML graphical requirements models, thus avoiding potential sources of specification mistakes.

2 Usability Evaluation

28 fourth-course Computer Science students took part in this evaluation. They were asked to carry out a series of modifications to an incomplete CSRML requirements specification. In ensure that the participants were familiar with the domain, the pro-

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vided CSRML requirements specification corresponded to a multi-user online strategy game, well known by the participants due to their studies and age. Usability was assessed by measuring the task's completion rate, the elapsed time, number of accesses to the help system of the tool and the instructor's verbal assistance. Globally, these results were considerably positive, with an 89.29% of the tasks correctly completed, with a mean completion time about 31 minutes (being 19 minutes the time that a CSRML reference expert took to complete the tasks) and an average efficiency of 17.85 correct tasks per hour. However, there was a surprising fact: the a priori easiest task obtained the worst completion result, making evident a problem with one on the CSRML elements that was solved afterwards in CT'13 [5].

As far as user's satisfaction is concerned, the used facial expression matching technique [1] showed up that when the participants dealt with easy tasks, they tended to behave pleasantly, but as the difficulty increased, this tendency changed to a calmer and less pleasant behavior, probably because they started getting used to interacting with CT'12 during the medium tasks. Nevertheless, when they finally had to deal with the hard tasks, there was a drastic change to more unpleasant behavior, due to the high complexity. These results confirm the pre-assigned task difficulty levels used in our study. This means that the tasks that we considered easy were in fact easy for the participants (as were the medium and hard). Regarding the questionnaire, the results obtained were satisfactory, with an average result for the whole questionnaire [3] of 6.06, taking into account that the questions were answered in a scale from 1 (strongly disagree) to 7 (strongly agree).

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