Use Case Diagrams in Support of Use Case Modeling: Deriving Understanding from the Picture

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ABSTRACT

Use case modeling in the Unified Modeling Language (UML) is a popular text-based tool for systems analysis and design. Use cases can be used with or without supporting use case diagrams. This paper uses an experiment to explore the effectiveness of including a use case diagram with a set of use cases. The Cognitive Theory of Multimedia Learning is used to hypothesize that the use case diagram improves the effectiveness of use cases for novice users by providing visual cues aiding model viewers in selecting and integrating relevant information. The level of understanding developed by participants viewing either uses cases or use cases with a supporting use case diagram was measured using comprehension, retention, and problem solving tasks. Results showed that participants viewing the use cases with the supporting diagram developed a significantly higher level of understanding, as measured by performance on the problem solving task, than participants provided with use cases alone. This analysis suggests practitioners should consider combining a visual representation, such as a use case diagram, with text-based use cases to achieve higher levels of understanding in persons viewing these descriptions.

Keywords: conceptual modeling; system analysis; unified modeling language (UML); use case modeling

INTRODUCTION

The Unified Modeling Language (UML) offers a standard language specification to support an object-oriented approach to systems analysis and design. The use case is a text-based description defined in the UML that provides a structured sequence of processes within a system (Jacobson, Ericsson, & Jacobson, 1994). Use cases are a popular modeling technique amongst UML practitioners (Batra, 2008; Dobing & Parsons, 2008) and use cases have received significant research attention (Burton-Jones & Meso, 2006; Siau & Loo, 2006). While text is a rich, familiar and expressive modeling tool, the exclusive use of