

**Development and Testing of an Evaluation  
Procedure for User Interface Management Systems  
(UIMS)**

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## DEVELOPMENT AND TESTING OF AN EVALUATION PROCEDURE FOR USER INTERFACE MANAGEMENT SYSTEMS (UIMS)

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### ABSTRACT

A user interface management system or UIMS is an interactive system for supporting the design, production, and execution of human-computer interfaces. This paper reports on the development and empirical testing of an evaluation procedure to produce quantifiable criteria for evaluating and comparing UIMS. The form-based evaluation procedure results in quantitative ratings along two dimensions: functionality and usability. Specification/implementation techniques used by a UIMS are also quantitatively rated. An empirical study has indicated that the procedure produces reliable, useful results.

## 1. INTRODUCTION

### 1.1. Background

A user interface management system or UIMS is an interactive system for managing all aspects of human-computer interface development, including specification, design, implementation, execution, evaluation, and maintenance. Despite tremendous efforts aimed at evaluating human-computer interfaces, very little research has been directed at evaluating UIMS. There currently are no standards for the components of UIMS, and no procedure for systematically evaluating or comparing them. With the recent proliferation of UIMS, evaluations and comparisons are constantly being done, but without a formal, structured approach. Systematic evaluation of these systems is difficult because of their many different varieties, their relative newness, and their inherent complexity.

This paper reports on the development and empirical testing of an evaluation procedure that uses a standardized technique to produce quantifiable criteria for evaluating and comparing UIMS. These data could be used, for example, for choosing a UIMS for a particular human-computer interface development environment.

### 1.2. Relevant Literature

The type of approach on which our UIMS evaluation procedure is based has been used successfully for evaluating other kinds of interactive systems. For example, Roberts and Moran [1983] produced a methodology for standardized evaluation of text editors,

based on classification of potential editing tasks and evaluation along several dimensions such as time to perform tasks, error costs, learning time, and functionality. Replication studies [Borenstein 1985] later produced some recommendations for modifications. A methodology for evaluating software packages, in particular commercially available word processing packages, was developed and used by Cohill, Gilfoil, and Piliotis [1988] at AT&T. Their methodology compared criteria such as performance, documentation, and support. Such approaches provided ideas used in developing our UIMS evaluation procedure.

## 2. A BRIEF OVERVIEW OF THE UIMS EVALUATION PROCEDURE

### 2.1. Evaluation Dimensions

Our procedure relies upon "hands-on" use of the UIMS to be evaluated. After learning the UIMS, an evaluator completes a detailed 28 page form that is oriented around two dimensions:

- Functionality, and
- Usability.

The dimension of *functionality* refers to what the UIMS can do. This dimension is divided into three sections in the form: types of interfaces supported (e.g., interaction styles, features, and hardware); types of support provided for interface development (e.g., prototyping, libraries); and general characteristics (e.g., consistency, integration). Each of these sections is further