

Timeliness Measurement Model: A Mathematical Approach for Measuring the Timeliness of Handheld Application Usage

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ABSTRACT

This study is aimed for developing a survey-based mathematical model specifically for measuring the timeliness of handheld applications usage. This study is designed to achieve five major objectives: identifying the elements for measuring timeliness, analyzing contributed factors of timeliness measures, developing a model for measuring timeliness, constructing formulas for measuring timeliness as well as prioritizing the overall timeliness of handheld application usage. As a result, a mathematical model namely Timeliness Measurement Model (TMM) is developed in which outlined thirteen timeliness measures in three different hierarchy levels of metrics, attributes and criterions. This model can be used for analyzing the timeliness of handheld application usage.

KEYWORDS

Design, tools, techniques, interfaces, models, principles, handhelds

1 INTRODUCTION

Handheld computing device is set to support anyone, anywhere and anytime environment. Clearly, this device has been criticized as one of the most excessively hyped new technology of all time [1]. Maintained as a small size computing device, display and window

dimensions are a very critical factor for handheld technology development [2], [3]. Constraining the screen size does have an effect on the performance of handheld computing devices and furthermore can significantly affect the timeliness of handheld application usage [4].

Several models were developed to overcome the problems however these models were not directly applicable to be implemented to measure the timeliness of handheld application usage specifically [5], [6]. One of the main gaps is that these models do not take into account the unique timeliness characteristics of handheld application usage. For examples, in [7], the researcher created a model that includes interactions and time that exist between the environment, participants and activities. In [8], [9] and [10], the researchers proposed a design model that considered the interaction between users, contexts, information presentations and data entry methods. Meanwhile, in [11], [12], [13] and [14], the models focused on the context of use, set requirements for the handheld application usage as the components of user, environment, tasks and interface.

Although research on these previous studies provides a lot of useful

