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The Case for Persuasive Interruptions in Healthcare

Muhammad Walji, M.S.[1], Kathy Johnson-Throop, Ph.D. [2], Jane T. Malin, Ph.D. [2], Jiajie Zhang Ph.D. [1]

[1]*School of Health Information Sciences, The University of Texas Health Science Center at Houston, Houston, TX, USA*
[2]*NASA Johnson Space Center, Houston, TX, USA*

Abstract

Interruptions in healthcare are often seen as distracting elements that need to be minimized. However, if designed effectively, interruption can also be used to increase efficiency, productivity, prevent errors, and even influence behavior. We propose a model to engineer persuasive interruptions based on the context of the users, the tasks they are involved with, and best presentations depending on the desired effectiveness of the interruption. Potential applications of this model include designing effective medication reminder systems for patients, or error prevention for clinicians due to persuasive feedback.

Introduction

Interruptions are often seen as obtrusive elements that need to be eliminated, managed or minimized.[1] However, interruptions are regularly used by people to set reminders, convey alerts and warnings, and to generally manage multi-tasked environments. Interruptions have the ability to increase efficiency and productivity for the system at a higher-level, if designed appropriately. Interruptions can also be used to persuade by capturing attention, influencing behavior, and changing attitudes. Applications of this research in healthcare are wide ranging. For example, patients can use persuasive interruptions to effectively remind them at the right time to take their medications, or help them exercise more frequently We propose a model of interruptions that exploits *User*, *Task* and *Presentation* Context which directly map to measures of *Interruption Effectiveness*.

A Model of Persuasive Interruptions

User Context

The main challenges in effective interruption design are to deliver an interruption to users when it is most opportune and the least detrimental. Therefore determining the context of the user may provide valuable information as to when an interruption may be most effective. A user's location, environment, time of day (or week or year), or schedule (in Outlook for example) may be exploited to establish context.[2] User characteristics and their work environment may also provide clues as to how best to engineer interruptions.

Task Context

It is also important to determine the context of the task the user is involved in. If a user is involved in a critical task, interruptions may not be tolerable. Intelligent methods of determining task context may include sensing the number and type of applications the user has opened or number of key strokes or mouse clicks within a certain time period. The users contextual information such as time of day or location may also provide clues as to context of the task.

Presentation Context

Based on the user and task context the presentation of an interruption can be tailored to achieve a particular goal. Presenting a warning will likely be very different than a reminder. The presentation may also differ depending on the device used to interrupt. Elements such as positive reinforcement, personalization, and social cues can also be used to enhance the persuasiveness of an interruption when appropriate.

Interruption Effectiveness

In our model we propose cognitive, emotional and performance based measures to evaluate and engineer interruptions. Cognitive factors may include loss of memory or disruptiveness of interruptions. Emotional factors such as annoyance and anxiety are often associated with interruptions. Interruptions affect performance, by changing time to complete tasks, providing opportunities for errors, and forgetting to resume previous tasks. In our model, information from the context of the user, tasks and presentation can be exploited in order to find an optimal balance between cognitive, emotional and performance measures depending on desired outcomes.

Conclusions

Although interruptions can be disruptive, annoying and sometimes devastating, they can also be used positively. We propose a model to engineer persuasive interruptions based on the context of the user, their tasks, and best presentation depending on the desired effectiveness of interruptions.

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