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Patients' intention to use online postings of ED wait times: A modified UTAUT model

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ABSTRACT

Background: As health care becomes more reliant on technology, a better understanding of the factors that contribute to acceptance and use of technology is now critical. The Unified Theory of Acceptance and Use of Technology (UTAUT) has been applied to study a variety of technologies in different settings, and it is one of the most cited theories in Information Systems (IS) research. However, there has been limited application of UTAUT to health IT and, in particular, to patients' IT use.

Objectives: The aim of this study is to adapt UTAUT to the context of patient acceptance and use of an Emergency Department (ED) wait-times website, and to empirically test the modified model and compare the results to those of the original UTAUT model. Specifically, it is proposed that there will be a significant relationship between facilitating conditions and behavioral intention.

Methods: A survey of patients in the ED of a Canadian hospital was conducted, yielding 118 completed surveys, and subsequently analyzed using Partial least squares (PLS).

Results: This study found that the modified UTAUT produced a substantial improvement in variance explained in behavioral intention compared to the original UTAUT (66% versus 46%). The modified-UTAUT model showed significant effects in performance expectancy ($r = 0.302$, $p < 0.01$) and facilitating conditions ($r = 0.539$, $p < 0.001$) on behavioral intention to use the website, while the effort expectancy impact was not significant.

Conclusions: This study provides empirical support for the modified-UTAUT in the context of patients' intention to use an ED wait times website. Some results of this study support prior research, while some differ, such as the non-significant relationship between effort expectancy and behavioral intention and the finding that performance expectancy is not the main driver of intention to use. As proposed, facilitating conditions – having the resources necessary to view the website and having the ability to find the website – were the most important factors influencing behavioral intention. UTAUT is a key theoretical advance in IS research and by modifying it to the context of patient use, we contribute to both IS and health research.

1. Introduction

The UTAUT, its originating theory of adoption, the Technology Acceptance Model (TAM), and other related models have been used to explain the acceptance and use of systems for the past 20 years. UTAUT was originally presented as an integration of eight different models and has become the most widely cited model of individual technology acceptance and use. Recent work has applied UTAUT to health care systems primarily in electronic medical records. However, UTAUT was developed outside of the healthcare context, and it is important to test and understand its application in this context [1,2–4] not only to help "increase the generalizability of the theory but also to make it more practically useful" [5].

This study applies and modifies UTAUT in the patients' use context, specifically examining patients' use of an ED wait times website. ED waiting times have been identified as a major problem facing healthcare systems around the world [6–8]. Countries such as Canada and the UK have instituted healthcare reforms that include establishing ED wait time targets [9,10] and the posting of ED wait times has become common practice in the USA [11]. In a literature review of ED wait times studies [12], only 11 articles were found and of these 11 none examined why patients did or did not use such websites. Nevertheless, hospitals are continuing to post wait times so it is worthwhile to study if patients use such sites and why [13].

2. Background and model development

2.1. UTAUT in the patient context

UTAUT identifies three direct determinants of behavioral intention

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to use a technology – performance expectancy (PE), effort expectancy (EE) and social influence (SI) – two direct determinants of technology use – behavioral intention (BI) and facilitating conditions (FC) – and four contingencies – gender, age, experience and voluntariness – all of which alter the effect of the determinants on intention to use a system and/or system use. Venkatesh et al [1] suggested that "future work should attempt to identify and test additional boundary conditions of the model in an attempt to provide an even richer understanding of technology adoption and usage behavior" (p. 470). In this study the health care context, specifically ED patients, provides an opportunity to test the model's "boundary conditions".

Despite the application of UTAUT to study acceptance and use in a wide variety of settings, it has had limited application in health care. In a literature review of 174 studies that applied UTAUT, Williams et al [14] identified only 10 studies in health care, of which only three [15–17] focused on patients use of IT, and only one of those three studies [17] actually collected and analyzed data. A google scholar search for UTAUT and patients revealed four more studies that used UTAUT to study patients' intention to use health IT [18–21] with conflicting findings in the results.

The relationship between FC and BI is particularly interesting. Despite the fact that the original UTAUT model does not propose a direct relationship between FC and BI, but rather between FC and use, four of the five studies of patients' use of IT examined this relationship with mixed results [18–21]. These findings indicate a need for further examination of factors contributing to patients' intention to use IT and the influence of FC specifically in the patient context.

3. The modified UTAUT

Fig. 1 shows the modified UTAUT used in this study which makes the theory more applicable to the context of patients' use of an ED wait times website. This model adds a direct relationship from FC to BI. Also, the original UTAUT model proposes that the relationship between FC and use is mediated by age and experience, and we propose that this mediation would also hold for the relationship between FC and BI. The effect would increase with experience as users are more familiar with technical support available, and for older users because they attach more importance to receiving help. We also modified the model by dropping voluntariness as a moderator since patient use of the ED wait times website is voluntary.

"Organizational facilitating conditions are defined as the degree to which an individual believes that a satisfactory level of organizational and technical infrastructure exists to support use of the system" (1, p. 453). In other words, FC examines whether aspects of the organizational and technical environments are designed to remove barriers to use. This definition contains two components, organizational and technical, derived from various IS theories. The organizational component, for example if a specific person (or group) is available for assistance with system difficulties, is based upon FC from the Model of PC Utilization (MPCU) [22]. Whereas the technical component, such as an individuals' resources/knowledge necessary to use the system, is derived from perceived behavioral control (PBC) from the Theory of Planned Behavior (TPB) [23]. Venkatesh et al [1] proposed that the key aspects of FC are largely captured with the EE and PE constructs in terms of the relationship to intention to use. They proposed that "when both PE and EE constructs are present, FC becomes nonsignificant in predicting intention" (p.454) and thus their UTAUT model does not include a direct relationship between FC and BI, but instead between FC and use, and they found support for these relationships. However, despite the fact that UTAUT does not propose a direct relationship between FC and BI, a review of 174 UTAUT studies [14] found that 48 of those studies examined a direct relationship between FC and BI, and 32 of those studies reported a significant positive effect. Although six studies were in health care none involved patients. Most studies appeared to examine this relationship because they were evaluating BI instead of system use. Notably, half of the studies that found a significant relationship between FC and BI also found significant relationships between EE and BI, and PE and BI, thus contradicting Venkatesh et al's [1] proposal that when both PE and EE constructs are present, FC becomes non-significant in predicting intention. These findings, combined with the conflicting findings found in the five patient-use studies previously mentioned [17–21], support the need to re-examine the relationship between FC and BI.

In UTAUT, FC are hypothesized to influence use directly as in an organizational environment, where users have access to FC such as training and support, FC serves as a proxy for actual behavioural control. However, in our study's context of ED patients, the FC can vary significantly among the users. Therefore, FC will act more like PBC in TPB and influence intention [23]. Thus, patients with more access to FC are more likely to show a higher intention to use the website. This is consistent with the argument made by Venkatesh et al [24] in the

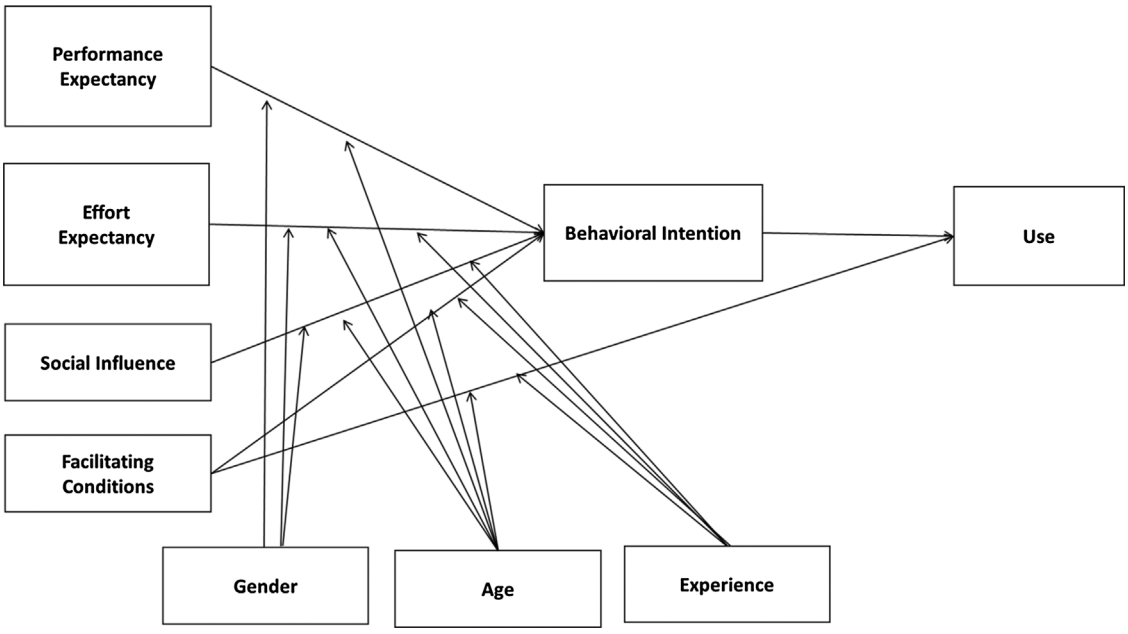

Fig. 1. Modified UTAUT for patients' use of health IT.