

Exploring the Influence of Users' Characteristics in Continuance Intention to Use Electronic Medical Records (EMR): Extending the Expectation Confirmation Model (ECM)

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Abstract. Even though the "user characteristics" (UC) can influence "acceptance" and "the continuance intention to use" of information systems such as electronic medical records (EMR), the effect of UC has not been adequately evaluated in post-adoption models. This study seeks to examine the effect of UC on post-usage of EMR using the expectation confirmation model (ECM). A total of 450 questionnaires was collected by a survey to extend ECM by integrating UC using structural equation modeling (SEM). Data were analyzed using LISREL through confirmatory factor analysis. A path analysis test was also performed to fit and confirm the model fit. The UC affects the "confirmation of expectations" directly and the "continuance intention to use" indirectly. The findings of the present study can provide a new path for further research on the extending of the ECM model. Moreover, end users' characteristics should be considered in the preparation and training phases of EMR implementation.

Keywords. Information systems, electronic health record, intention, motivation

1. Introduction

EMRs play an important role in the healthcare industry through facilitating timely access to health information, decreasing medical errors, and improving patient care

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effectiveness and efficiency. Despite the potential benefits of such information technologies, developing and deploying these technologies is not enough since the technology should be accepted and used by end-users [1]. In spite of the fact that EMRs are expected to create better healthcare outcomes, the slow rate of its adoption has been a concern in developing countries [2]. Thus, identifying, predicting, and managing users' adoption and post-usage of EMR is one of the key factors in its successful implementation [3]. The expectation confirmation model (ECM) is one of the earliest information system (IS) post-usage and continuance models that integrates major constructs in terms of perceived usefulness, expectation confirmation (EC), and satisfaction (SA) in continuance intention to use (IU) information systems including EMRs [4]. Although ECM is a robust model for understanding the determinants of IS continuance, there is a variety of contributing factors such as the opinions of others, external factors, and user characteristics which have not been addressed by the ECM model. It is shown that user characteristics have significant effect on performance expectancy [5]; in addition, "user characteristics" including self-efficacy, job satisfaction, computer anxiety, age, gender, and computer literacy can influence "the continuance intention to use" which affect job satisfaction and users performance [2-7]. thus, this study aims to extend ECM by incorporating "user's characteristics" into this model.

The research hypotheses were the following:

- User's characteristic (UC) is related to expectation confirmation (EC)
- User's characteristic is related to perceived ease of use (EU)
- User's characteristic is related to perceived usefulness (PF)
- User's characteristic is related to perceived enjoyment (PE)
- Expectation confirmation is related to perceived EU
- Expectation confirmation is related to PF
- Expectation confirmation is related to PE
- Perceived ease of use is related to satisfaction (SA).
- Perceived usefulness is related to SA
- Perceived enjoyment is related to SA
- Users' satisfaction is related to continuance intention to use (IU).

2. Method

A total of 450 questionnaires was collected by a survey to extend ECM by integrating user characteristics using structural equation modeling (SEM). A confirmed questionnaire [7,8] containing 44 questions in three sections including demographic data, users' characteristics, and ECM model constructs were used to collect data. EMR end-users' responses were evaluated based on a five-point Likert strongly agree (5) to strongly disagree (1). Data were analyzed using SPSS and LISREL through confirmatory factor analysis. R-squared coefficients (R²) were used to assess the structural model computed for all endogenous constructs. A path analysis test was also performed to fit and confirm the model fit using LISREL software. The causal relationships of dependent and independent variables were measured through standard coefficient and significance values by LISREL software; consequently, a decision was made to confirm or reject the hypotheses based on the measured values. The current study was supported by the Vice-Chancellorship for Research & Technology at Kashan

University of Medical Sciences [Code# IR.KAUMS.MEDNT.REC.1393.1232] and grant number 9330.

3. Result

72% (n = 324) of the participants in this study were female and 28% (n = 126) were male and most of them (59.9%) had a bachelor's degree. The direct, indirect, and total effect of variables on the dependent variable of “continuance intention to use” in the final model are presented in Table 1.

Table 1. Results of the model validity

Variable	Direct relationship	Indirect relationship	Total effect
User Characteristic (UC)	-	-0.023	-0.023
Expectation confirmation (EC)	-	0.513	0.513
Ease of use (EU)	0.47	0.47	0.47
Perceived usefulness (PF)	0.27	0.27	0.27
Perceived enjoyment (PE)	-	0.061	0.061

(R²) IU 0.83, (R²) SA 0.50, (R²) EU 0.87, (R²) PF 0.78, (R²) PE 0.55, (R²) EC 0.033

As shown in table 1, “Ease of use” with a value of 0.47 had the most impact on the “continuance intention to use”. The other factors including “perceived benefits” (0.27), “confirmation of expectations” (0.513), “satisfaction” (0.061), and “user characteristics” (-0.023), affected the “continuance intention to use” respectively after “ease of use” variable. The results of the SEM path analysis for the final model are indicated in Figure 1.

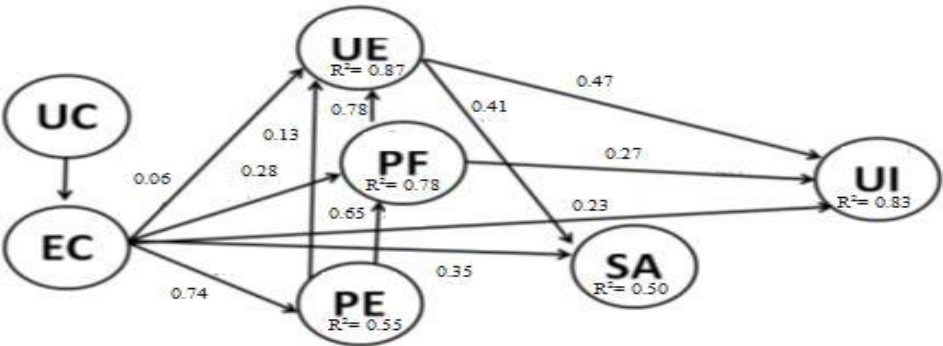


Figure 1. SEM path analysis results Notes: ** p < 0.01, * p < 0.05

4. Discussion

Although the “user characteristic” has the least effect on the “the continuance intention to use”, this construct affects the “confirmation of expectations” directly and the “continuance intention to use” indirectly. Similar to previous studies, “user characteristics” affect users' expectation confirmation [9, 10]; thus, it should be considered in the preparation and training phases of EMR implementation [11]. Considering user's characteristics during EMR implementation and ongoing education not only would ensure the success of adoption and post-usage of EMR but also has a positive impact on end users' satisfaction and efficiency [2]. In contrast to previous studies [12, 13], “user characteristics” had no impact on the ease of use and perceived enjoyment. The findings of the present study can provide a new path for further research on the extending of the ECM model based on the integration of user characteristics and other emerging factors which affect the continuance intention to use information systems.

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