Factors influencing the intention to use wireless Technology in Healthcare: An Indian Study

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Abstract

This study reports the factors that influence the intention in using a wireless technology for the Indian healthcare setting. Using both qualitative and quantitative techniques, physicians as well as health professionals from the Indian medical systems were approached for data collection. The qualitative data were used as a basis to develop a quantitative instrument. Both types of data (qualitative and quantitative) established technology factors, clinical factors, administrative factors and communication factors play a crucial role in determining the intention in using wireless technology in the Indian healthcare. These factors were further validated using a second order regression model to ensure their validity and reliability. The major contribution of this paper is identifying a number of factors influencing the intention and statistically validating such factors, perhaps for the first time in the Indian healthcare context.

Keywords: PLS Model, Healthcare Technology, Wireless Technology

INTRODUCTION

Latest trends in the healthcare sector include the design of more flexible and efficient service provider frameworks. In order to accomplish this service provider framework, wireless technology is increasingly being used in healthcare specifically in clinical domain for data management. Even though the future of wireless devices and usability is promising, adoption of these devices is still in infant stages due to the complex and critical nature of the healthcare environment [1]. However, there is limited knowledge and empirical research in regards to the effectiveness and adoption of wireless technology in the healthcare systems. [2], after an evaluation of about fifteen articles in the combined domain of technology and health asserted that current technology acceptance models are only partially adequate and applicable in the professional contexts of physicians (p.22). A profound implication of this assertion is that the relationship of wireless technology adoption, strategy, implementation and environmental issues pertaining to the clinical domains are yet to be established. This notion prompted this research with the following research question:

• What are the clinical influences of wireless technology in healthcare systems in India? I employed a qualitative method to extract initial themes from healthcare stakeholders and then derived a quantitative instrument based on this qualitative data. This is explained in the next section – methodology.

METHODOLOGY

The research question dictates the need to have quantitative research methods, while the behavioural component of the same investigation dictates qualitative research methods. In essence, to answer the research question, both methods are required. Qualitative methods will help to understand the domain and the context in a practical sense. Quantitative methods will assist to generalise our findings. Within this method, I used a mixed-method approach, where the initial exploratory phase is conducted using a qualitative approach and the second main phase is conducted using a quantitative approach.

Data Collection & results

As argued, for the first stage of this research a qualitative approach was used to collect initial sets of themes for the adoption of wireless technology by the physicians in the Indian healthcare systems. For this purpose, the first stage of the data collection concentrated on randomly identifying 30 physicians each from India with some form of wireless technology already in use. The physicians were also selected based on their wireless technology awareness or working experience. They were drawn from both private and government hospitals. A set of initial themes were extracted from these interviews for a quantitative instrument. The qualitative analysis indicated that there is a clear set of drivers and inhibitors emerging from the interviews. The driver themes were extracted when there was a positive statement and the inhibitors when there was a negative sentiment. Therefore, it appears that positive influences drive the technology adoption and the negative influences inhibit the technology adoption.\

Quantitative Data Collection & analysis

The survey was then distributed to over 300 physicians in India. The sample was randomly chosen from the telephone book. A total of 200 surveys were received. The survey responses were then transcribed into a spreadsheet file. The reliability test returned a Cronbach alpha value of 0.965 for the instrument indicating high reliability [3]. We ran this test because the instrument was generated from the interview data and, hence, it was necessary to establish statistical reliability. In addition, reliability tests were also run for three factor groupings, namely, drivers, inhibitors of adoption and other technology factors. The reliability tests returned values of 0.941, 0.447 and 0.536, respectively, indicating that the data were suitable for further analysis testing. A further factor analysis also returned a set of new factors and these were groped under 'clinical usefulness and reported in the following table.

Table 1: 'clinical usefulness' of wireless technology adoption in healthcare

	General Communication	Clinical Communication	Records Management
Obtain lab results	.837		
Administrative purpose	.770		
Electronic prescribing	.670		
Medical database referral	.632		
Patient education		.727	
Communication with colleagues		.707	
Communication with patients		.676	
Drug administration		.596	
Communication with physicians		.548	
Electronic Medical Records			.764
Generating exception list			.738
Note taking			.617
Disease state management			.563

The above factors were then tested using Partial Least Squares (PLS) program in order toverify their statistical granularity. The following table is extracted from PLS to depict the weights of each construct.

Table 2: Weights of the formative indicators

Construct	Indicators	scaled weights
Clinical Usefulness	EMR	0.552 ***
	obtlabresults	0.0775
	Electrprescribe	0.048
	notetkng	0.311
	ptnteducation	0.16
	commcolleagues	0.011
	exceptionlist	0.046
	databaseref	0.142
	commphysicians	0.99
	admnpurpose	0.013
	drugadmn	0.262
	diseasemgt	0.211

$*\ p < 0.05;\ **\ p < 0.01;\ ***\ p < 0.001$

The study supported that clinical usefulness of wireless technology influence technology adoption. It is also noted that R_2 is significant (0.976). Therefore the data explains 97.6% of the variance of clinical usefulness in India.

IMPLICATIONS & CONCLUSIONS

This research has a number of theoretical and practical implications. In order to discover the factors of wireless technology adoption in health sectors in India, traditional adoption models were not used. A ground up approach was used by developing the factors via qualitative filed study. From theoretical view point it is shown how a ground up approach can be applied in situations where no traditional model can be applied. This paper details this process. The future research should look into the use of multi-group analysis. The issues of sample size should also be addressed. This research has reported how a ground up research is undertaken in order to establish factors influencing technology adoption.

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