

# Applying Technology Acceptance (TAM) Model to Determine the Factors of Acceptance in Out-Patient Information System in Private Hospital Sectors in Chennai City

**Suresh V,**

*Research Scholar (Asst. Prof., Faculty of Management-SRM University),*

**Dr. K. Prabhakar**

*Dean, Faculty of Management, SRM University, dean.mgmt@ktr.srmuniv.ac.in,*

**Dr. K. Santhanalakshmi,**

*Asst. Prof., Faculty of Management, SRM University,*

**Dr. K. Maran,**

*Professor&Head, Sri Sairam Institute of Mgmt. Studies, maran.mba65@gmail.com*

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## Abstract

Emerging interest in end users' reactions to health information technology has developed the importance of theories that predict and explain health information technology acceptance and use. This study analyse the application of one such theory, the Technology Acceptance Model (TAM), to health care. This study proposed a theoretical framework that includes the core constructs in TAM: namely, perceived ease of use and perceived usefulness. Additional external variables were also adopted— namely, customised information and Trustworthiness. The overall research model suggests that all mentioned variables either directly or indirectly affect the level of information by social media from they got to use an out-patient's acceptance of technology in private hospital sectors. Based on data collected from 200 out-patient in private hospital in Chennai city, Exploratory factor analysis were used to identify the factors are influenced to acceptance of technology in out-patient of private hospital sectors.

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## INTRODUCTION

The information technology (IT) is used broadly to complete the work tasks it is easy to overlook how work was done before IT was universally available in organizations. The technology shift has spread out over the field of healthcare, leading with it a digital transformation in the way doctors and patients coordinate. The combinations of network and information technology have now become the centre of the "new era" where both, digital and human aspects, are very important to the complete patient experience. The patient care experiences are top of the mind in the healthcare industry across the globe today. Frost and Sullivan mentioned that, India's health information technology market is anticipated to hit \$1.45 billion in 2018, more than three times the \$381.3 million reached in 2012. The increasing connection of technology and healthcare because there is a enormous opportunity for providers to enhance the patient care experience and drive more efficiently due to increased association and information sharing among providers. Healthcare information technology care are able to avoid redundant or duplicate tests /procedures and mechanise manual processes, modernise medical care and reduce costs. The increased acceptance of telemedicine, Health Information System (HIS), electronic health records, Mobile-Health, and web-based services has made digital patient data expand, demanding the deployment of robust IT infrastructure in Indian healthcare organisations. It has

amplified growth in data, digitization trends in health information and electronic medical records. One of the key pillars of health transformation is being able to refine access to the best healthcare for a larger segment of the population. The implementation of technology is a cost-effective and convincing method to connect clinics in the cities as well as rural regions. Although there are healthcare challenges we are facing today, the good news is that we have innovative solutions to help address these alarming challenges. Technology advancements in healthcare informatics, telemedicine, HIS, electronic health records, remote diagnostic and therapeutic tools have rotated the first step towards tech enabled healthcare and can be further improved to effect new modalities of healthcare. Today, healthcare organizations need to modernize their IT infrastructure, to be able to give simple, quicker and more efficient and effective healthcare service or delivery. The healthcare solutions encourage a new productivity model whereby the final winner is the patient, who will now have immediate reasonable access to the best clinical expertise.

## REVIEW OF LITERATURE

Chau & Hu (2002) suggested the acceptance of telemedicine technology among 408 physicians, comparing and examining of Technology Acceptance Model (TAM). (Jayasuriya 1998) mentioned that the research on TAM, that was applied in an Australian community health service, where perceived usefulness was a very prominent factor of

usage. Chismar & WileyPatton (2003) conducted the test of application of TAM2 to the acceptance of Internet and Internet-based health information applications among 89 paediatric physicians. Results partially confirmed the model; however, a core construct of the model was not supported by the findings. Lee et al. (2011), mentioned the healthcare IT has become the generally accepted umbrella term to describe as application which collect, store, analyze, process, and share the healthcare information with the utilize of computer hardware, software, telecommunication devices. The victory of health IT depend on the reception and contribution of clinical physician. Thus, exploring the nature and resolution factors that impact the IT adoption are found critical in both practical and research perspective. To expand the central concern of IT acceptance, a number of theoretical models have been derived such as Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB) and TAM. Among the models, TAM has broadly constructed in the Information System (IS) studies. (Davis, Bagozzi & Warshaw, 1989) TAM found when one's perspective that the perceived ease of use and the perceived usefulness of technology will direct to better behavioural intention to adopt such technology. Formerly attitude is included in TAM as a variable; afterwards it was omitted due to the lack of association towards the behavioural intention. (Wang Wang, Lin & Tang, 2003) In the past ten years, TAM has been using in research due to its simplicity, understanding ability and flexibility in various contexts. (Davis 1989) TAM was developed by Davis in year 1989, which derived from Theory of Reasoned Action (TRA) theory. It is primarily aimed for the motivation factors, which mould an individual intention to understand and use Information Technology (IT). TAM projected two essential independent factors: Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) to measure the technology acceptance intention. PEOU defined as "the degree to which user believe the target systems to be free of effort" and PU defined as "subjective likelihood that using the system will increase one's performance". (W.C. Chin, et al. 1995) Information systems researchers have explored the technology acceptance model, and discovered it to be suitable for predicting the individual's acceptance of corporate Information Technology (IT) systems. (Venkatesh and Davis 2006) developed an extension of TAM2, which composed of social influence processes (subjective norm, voluntarism, and images) and cognitive instrumental processes (job relevance, output quality, result demonstrability, and perceived ease of use). (Feng-Cheng Tung a,b, Su-Chao Chang a, Chi-Min Chouc 2007): Even the National Health Insurance was introduced in 1995, the number of insurants improved to over 96% from 50 to 60%, with a continual satisfaction rating was 70%. Even though, the premium estimation is 5.77% of GDP in 2001 and the Bureau of National Health Insurance had forcing financial difficulties, so it increased its expenditure systems, such as capitation, case payment, fee for service, and the global budget system are increasing the medical costs because the changes in health insurance policy, most hospitals tried to improve efficiency and reduce their

operating expenses. Initiating the electronic logistics information system is one of the key factors to reducing the cost of the department of central warehouse and the nursing stations. Therefore the study developed a technology acceptance research model and examines how nurses' acceptance of the e-logistics information system has been impacted in the medical industry. (Deven McGraw, James X. Dempsey, Leslie Harris & Janlori Goldman 2009) mentioned the privacy and security protections into health information technology systems will support trust in such systems and promote their adoption. The privacy issue is a main barrier to electronic health information exchange, can be rectified through a complete framework that gears core privacy principles, implements trusted network design characteristics, and develops the supervision and answerability mechanisms. The public policy challenges of applying this framework in a complex and developing environment will need improvements to existing law, new rules for entities outer the traditional health care sector, a more strategized approach to the role of consent, and stronger implementation mechanisms. (Carleen Hawn 2009) considered "Hello Health," the Brooklyn-based necessary care practice that is fast attractive symbol of modern medicine. A paperless, caretaker practice that renounces the limitations of insurance-based medicine, Hello Health is trendy and winning largely because of the dominant and cost-effective strategy of communications employs: Web-based social media really across the health care industry, from huge hospital networks to patient support groups, now trendy media tools like weblogs, instant messaging platforms, video chat, and social networks are restructuring the way doctors and patients interact.

#### Research objectives

1. To impact of technology acceptance on out-patient in private hospital sectors.
2. To study the user perceptions of out-patient in private hospital sectors.

#### Research questions

1. Does accept the technology of out-patient in private hospital sectors?
2. Is the technology acceptance model is the right channel to promote the health information?

#### Research Methodology

In this study Descriptive research design has adopted by random sampling techniques with sample size as 200

##### Method of data collection

The data collected for the study includes both primary and secondary data in order to attain the objectives of the study. The primary data is collected by using questionnaire. Apart from this information secondary sources are collected from the newspapers, magazines, journals and books.

## Data Analysis and Discussions

Table 1:

**Reliability Statistics**

Cronbach's Alpha	No of Items
0.929	18

## Factor Analysis:

Table 1 contains the result regarding the reliability statistics of the sample. The Cronbach's Alpha indicates that the sampling reliability is 0.929 implying that the samples that mostly fit this study.

Factor analysis was used with KMO and Bartlett's test for sphere city and Varimax rotation was applied.

In order to identify the factors which determine the factors of technology acceptance model on out-patient of health sectors with help of social media factor analysis was performed. The results are presented below.

Table No.2

**KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.918
Approx. Chi-Square	1996.335
Bartlett's Test of Sphericity	df
	153
	Sig.
	0.000

Table 2 contains the result regarding the sample adequacy and sphericity of the sample. The KMO test indicates that the sampling adequacy is 0.918 implying that the samples are most relevant. As regards the nature of the sample, the statistically significant Chi-square value is [1996.335] indicates that the sample conforms to normality.

Table :3 contains the result regarding the total variance explained of the sample. This table indicates that more than.61% of the variables are totally converged in three components of the total variance explained of the sample.

From Table 4, it is clear that the first component has totally 9 factors are heavily loaded, viz., It is easy for me to

mingle with group, It is easy for me to guide others in right way in SM, It is easy for me to communicate rapidly with group in SM, i feel to get right information on my profile on SM with my compatible likings, i feel to get right information on my profile on SM platforms are customized to my needs, i feel recommend information on my profile on SM website make me feel as important to others, social media gives a feeling of trust, i have trust in my communities on social media and the virtual community groups give me a trustworthy impression. The above nine factors names are called easy use of technology. All people have been thinking about their ability to manage their health and the health of those they care for. Whenever, with the increasing difficulty of health information and health care settings, the most of the people need additional information, skills, and supportive relationships to meet their health needs. During the present decade, the speed, scope, and scale of adoption of health IT will only increase. Social media and trending technologies promise to unclear the line between expert and peer health information monitoring and evaluating the impact of these new media. Social media allows many opportunities for health systems. It permits organizations to increase connections, share discoveries, and develop dependability as thought leaders. While other industries aware about the amount of likes and followers they obtain, healthcare focuses on mobile health, on public health will be challenging. The ideas about health and behaviours are structured by the communication, information, and technology that people communicate with every day. Health information technology (IT) and health communication are hub to health care, public health, and the way of our society views health. These activities make up the framework and the methods professionals and the public search for, understand, and use health information, essentially effecting their health decisions and actions. The generally people believes easy use of technology, that will improve health care efficiency, quality, safety, and cost.

Table No.3 Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.232	45.731	45.731	8.232	45.731	45.731	4.795	26.637	26.637
2	1.813	10.073	55.803	1.813	10.073	55.803	3.497	19.429	46.065
3	1.073	5.964	61.767	1.073	5.964	61.767	2.826	15.702	61.767
4	.959	5.329	67.096						
5	.781	4.342	71.437						
6	.650	3.611	75.048						
7	.586	3.257	78.305						
8	.536	2.979	81.284						
9	.521	2.893	84.177						
10	.491	2.727	86.904						
11	.402	2.232	89.136						
12	.342	1.903	91.038						
13	.313	1.739	92.777						
14	.301	1.674	94.451						
15	.286	1.588	96.039						
16	.266	1.476	97.515						
17	.238	1.321	98.836						
18	.209	1.164	100.000						

**Table No: 4**

	Component		
	1	2	3
12a It is easy to learn what i want in SM			.736
12b It is easy for me to mingle with group	.504		.545
12c It is easy for me to guide others in right way in SM	.633		
12d It is easy for me to adopt to the technology of SM			.508
12e It is easy for me to communicate rapidly with group in SM	.529		
13a using the SM in my job enables to accomplish tasks very quickly		.558	.646
13b using the SM improve my job performance		.709	
13c using the SM in my job increases my job productivity		.725	
13d using the SM enhance my effectiveness on the job		.787	
13e using the SM made it easier to do my job		.718	
13f i find the SM useful in my job		.713	
14a i feel to get right information on my profile on SM website			.644
14b i feel to get right information on my profile on SM with my compatible likings	.659		
14c i feel to get right information on my profile on SM platforms are customized to my needs	.664		
14d i feel recommend information on my profile on SM website make me feel as important to others	.737		
15a social media gives a feeling of trust	.710		
15b i have trust in my communities on social media	.700		
15c the virtual community groups give me a trustworthy impression	.786		

**Extraction Method: Principal Component Analysis.**

**Rotation Method: Varimax with Kaiser Normalization.**

**a. Rotation converged in 9 iterations.**

From Table 4, it is clear that the second component has totally 5 factors are heavily loaded, viz., using the SM improve my job performance, using the SM in my job increases my job productivity, using the SM enhance my effectiveness on the job, using the SM made it easier to do my job, I find the SM useful in my job. The above five factors name is called effectiveness of technology. The growth in the mobile sector has been truly stunning and clearly everyone has gained. In the last 12 years, mobile charges are being sold at a reasonable price so everyone owns a mobile phone. There are more mobile phones today than there are toilets in India. Most consumer goods that are need the products of digital technology of laptops, cameras, DVD players, television sets and etc, that have also exposed impressive reduction in costs and are quickly becoming available to more people. In addition to, developing minimization of the components of digital technology has permits most gadgets to become smaller with time. The technology is used by the consumer, but actual "consumer" is patient because it is he or she finally pays for the product (and the service). This is mainly true in most of the developing world where healthcare delivery is totally disorganized with a very small proportion of the

population having health insurance. Whereas the consumer (patient) pays to the manufacturer (product) and the service (to the health professionals), when the demand is synthetically formed to justify the use of technology, it becomes exploitative. Healthcare technology assessment is the multipurpose evaluation of medical technologies with consider to effectiveness, feasibility, safety, cost, cost-effectiveness and signal for use of the technology. Whole health technology measurement should search the technical, ethical, economic and social reasons for utilizing a new technology and how such technologies will influence the out-patient of service and the distribution of resources in medical industries.

From Table 4, it is clear that the Third component has totally 4 factors are heavily loaded, viz., It is easy to learn what i want in SM, It is easy for me to adopt to the technology of SM, using the SM in my job enables to accomplish tasks very quickly, I feel to get right information on my profile on SM website, the above four factors name are called adoptability of technology. Technology adoption and utilization is less contentious when there is a well described clinical need—such as a

severe or urgent medical problem and also when there are minimum alternatives only available. Whenever, major factors that impact the utilization in technology are the economical advantages to both the physician and the hospital. Other factors that impact the technology adoption and utilization consist of patient preferences, a strong driver; patients in the us often ask for the latest technology, often with minimum evidence of clinical benefits, believing it is the best; regulation, reputation of the promotes of the new technology; prestige ,compatibility with practice style; and existing litigation climate. But patients in India are rarely adopted the latest technology. Finally, the utilization of health care technologies is centred on physician priorities to be both effective and to use well-accepted clinical practices to the patient in health sectors.

#### Limitations of the study

1. This study is focused mainly on out-patients of private hospitals only.
2. The area of study is restricted only in Chennai city.

#### CONCLUSION

Users' perception of usefulness and ease of use are important determinants providing the incentive for users to accept information technologies in out-patient of health sector system is attempted. This study shows that 'perceived usefulness', 'perceived ease of use', 'customized information' and 'trustworthiness' all have great positive influence on 'acceptance to use the technology of out-patient in health sectors'. The findings of the present research suggest that user acceptance of technology is a key element and should consequently be the major concern to health organizations and health policy makers. Finally Impact of information technology in Indian healthcare services has been transforming into a managed care services.

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